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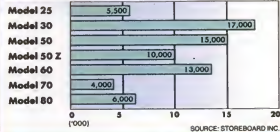
Volume 10, Issue 36

INFO WORLD

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THE
PC
NEWS
WEEKLY

Micro Channel Machines Outsell Models 25 and 30

PS/2 SALES FOR JULY



The Model 50 Z, introduced in June, has helped boost retail sales of IBM's Micro Channel-based PS/2s, according to Storeboard Inc.

IBM's Micro Channel Systems Surpass Other PS/2s in Sales

By Alice LaPlante

IBM PS/2 machines containing the Micro Channel Architecture (MCA) are now selling at a rate of 2-to-1 over PS/2s without the MCA, according to recent research by Storeboard Inc.

But IBM continues to lose market share to both Compaq and third-party clone makers.

Non-MCA machines — the Models 25 and 30 — sold a total of 22,500 units in July through retail stores, while MCA machines — the Models 50, 50 Z, 60, and 80 — sold 48,000 units during that month. (See accompanying chart.)

If anything, the research is

probably skewed in favor of the low-end PS/2s, since many of the more expensive and powerful members of the PS/2 family are sold through value-added dealers and resellers — sales not tracked by Storeboard, said JoAnne Stahl, the firm's vice president of research.

IBM's recently announced Model 50 Z has been a success since its introduction in June, but the Model 70 — IBM's desktop 386 machine — is off to a slow start, said users and dealers last week.

"Going to the Model 50 Z
[See MCA, Page 8](#)

HP Plans to Unveil Laser Printer That Prints on Both Sides of Paper

By Martin Marshall and Bob Panting

Hewlett-Packard Co. is getting ready to unveil the LaserJet IID, a laser printer capable of printing on both sides of a sheet of paper, said sources close to HP.

The process, called duplex printing, prints the paper on one side, then a roller automatically feeds the paper back into the engine to print on the other side. The printer is expected to be announced in late fall, sources said.

HP officials would not comment on the unreleased product. "We are looking at a number of different products for future introduction, but we can't comment on specifics," said LaserJet product manager Jim Lyons.

The new printers will have letter- and legal-size paper trays; with adjustments, they can also handle European A4 and executive paper sizes. Each of the

[See HP, Page 97](#)

IBM to Roll Out Pair of Model 30s, RPG II Platform, Updated Proprinter

By Alice LaPlante and Mark Brawnstein

Be prepared for a rash of IBM announcements September 13.

In addition to introducing a pair of new Model 30 PS/2s and a slew of printer products, IBM will unveil its "RPG II Applications Platform," which will allow PS/2s running OS/2 to access the 4,000-application library of the System/36 family and to perform as a multiuser system, according to sources close to the company.

IBM's Entry Systems Division chief William C. Lowe earlier this year promised the

industry it would see RPG applications running under OS/2 by the end of 1988.

Both of the new Model 30s — Versions 30-E01 and 30-E21 — will be based on Intel's 10-MHz 286 chip with one wait state. The machines also have three slots and 1 megabyte of RAM expandable to 4 megabytes.

The E01 configuration will have one 3½-inch 1.4-megabyte floppy drive; the E21 machine will have both a floppy and a 20-megabyte hard drive.

Both machines also will have the VGA graphics formerly found only on the high-end PS/2 machines that contain the Micro Channel Architecture. Previous versions of the Model 30 did not have VGA.

In addition, the new machines will use the standard 16-bit AT bus, meaning that boards and cards used on IBM's PC AT and machines from third-party PC vendors will work. The original Model 30, based on the 8086 chip, used the standard XT bus.

[See IBM, Page 97](#)

TI, Matsushita Endorse SPARC RISC

By Martin Marshall

In a big week for advocates of Sun's SPARC RISC, both Texas Instruments and Matsushita endorsed the chip architecture. TI is the first major semiconductor vendor to adopt the SPARC architecture.

TI's endorsement came in the form of a cross-licensing agreement with Cypress Semiconductor of San Jose, California. For TI, the deal represents a quick entry into SPARC chip and workstation development.

"We believe RISC and Unix provide an excellent foundation for the merger of symbolic and conventional processing in commercial applications," said Peter Van Cuylenburg, vice president of TI's Data Systems Group.

TI will create a new series of workstations, into which it will evolve both its Microexplorer line and its System 1000 line of workstations, said Cuylenburg. The new workstations will not

Firms Target RISC Integration

The next step in the process of popularizing RISC architectures will be higher integration, according to several companies that are developing the next generation of RISC parts.

"We will be making our version of the SPARC chip family," said Roger Ross, who formerly headed the 88000 development team at Motorola and is now president and CEO of Ross Technology Inc., in Austin, Texas. Ross Technology is working closely with Cypress Semiconductor to develop SPARC products.

"The first thing will be to develop peripheral support chips to be sure we have a family to surround the Cypress CPU,"

[See RISC, Page 97](#)

be introduced soon, according to TI. TI SPARC-based workstations may not be ready until mid-1989.

The cross-licensing deal will also give a major boost to Cypress. "Our biggest customers are being demanding that a

major semiconductor company become a second source; now we have that," said Cypress president T.J. Rodgers.

In the TI-Cypress Semiconductor exchange, which is the first cross-licensing in the

[See SPARC, Page 97](#)

AT DEADLINE

Compaq Pushes Bus Consortium

Compaq Computer Corp. is attempting to form a consortium of PC makers to standardize on a 32-bit version of the AT bus, according to industry sources.

In addition, Compaq Computer is planning to announce soon a 286 desktop and two laptops that use the 386SX and 386 chips, sources said.

PC vendors, including Zenith, NCR, Hewlett-Packard, Tandy, Dell Computer,

AST, and Everex, have all been contacted regarding joining the bus consortium, according to the sources. Phoenix Technologies Ltd. of Norwood, Massachusetts will contribute part of the systems software for the proposed standard, said a source close to the company.

"We have been talking with other [leading] companies for quite some time about how changes can be made to the AT standard to

[Continued on Page 3](#)

Why Paradox 2.0 makes your network run like clockwork



Paradox* runs smoothly, intelligently and so transparently that multiple users can access the same data at the same time—without being aware of each other or getting in each other's way.

With Paradox news travels fast and it's always accurate

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How to make your multiuser network work

To run Paradox 2.0 or the Paradox Network Pack on a network, you need:

- Novell with Novell Advanced Network version 2.0A or higher
- 3Com 3Plus with 3Com 3+ operating system version 1.0, 1.1 or higher
- IBM Token Ring or PC Network with IBM PC Local Area Network Program version 1.12 or higher
- Lotus Tapestry version 1.45 or higher
- AT&T Starlan version 1.15 or higher
- Banyan VINES version 2.10
- Other network configurations that are 100% compatible with DOS 3.1 and one of the listed networks

System Requirements for the Network Workstation

- DOS 3.1 or higher
- 640K RAM
- Any combination of hard, floppy, or no disk drives
- Compatible monochrome, color, or EGA monitor with adapter

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“When I saw the record-locking and autorefresh in action, I couldn't believe it. Here was a true network application, a program that can actually take advantage of a network to provide more features and functions, things that can't be done with a stand-alone PC.

Aaron Brenner, LAN Magazine

With Version 2.0, Paradox becomes a sophisticated multiuser product that boasts an impressive selection of data-production features and password-security levels.

Rusel DeMaria, PC Week ”

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Mark Cook and Steve King,
Data Based Advisor ”

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Jim Seymour, PC Magazine ”

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SEPTEMBER 5, 1988

INFO WORLD

THE PC NEWS WEEKLY



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AT DEADLINE

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continue to enhance its functionality vis-a-vis the promises of the Micro Channel," a Compaq spokesman said.

"We have not yet been contacted by Compaq, but we are expecting to be," said Michael Conley, associate vice president of marketing for Acer Technologies Corp., in San Jose, California. Acer has not yet decided to support the Compaq consortium.

While declining to comment on Tandy's possible involvement in the consortium, Mark M. Yamagata, senior director of marketing for Tandy Electronics, said that such an organization would make the AT bus a standard everyone could easily adapt to.

The IEEE bus would be similar to the AT bus under consideration by the JEBB P996 committee, sources said.

The expected Compaq desktop machine will be smaller than the current Deskpro 386, and it would include 1 megabyte of memory, a single floppy drive, and no hard drive, according to sources. The battery-powered laptops will offer displays with 640-by-480 resolution, full-size keyboards, and 20-megabyte hard drives, sources confirmed.

One source said that it was told by Compaq that the desktop will be announced on September 13, and the laptops will be announced on September 19.

—InfoWorld Staff

Microsoft Splits Application Group

Microsoft Corp. last week radically reorganized its application division in a move aimed at accommodating the group's expected growth over the next five years.

To foster what the company called "a small company attitude" within the \$600 million software company, the division was broken into five business units.

The new business units are the Office Business Unit, headed by Jeff Raikes, with responsibility for Microsoft Word and Mail; the Graphics Business Unit, under Bob Gaskins, which will handle PowerPoint; the Entry Business Unit, managed by Susan Boeschen, with Works, Learning DOS, and Flight Simulator; the Data Access Business Unit, under Jeff Harbers, with File and Quick Basic; and the Analysis Business Unit, headed by Pete Higgins, with Excel, Multiplan, and Project.

—Stuart J. Johnston and Rachel Parker

DCA Expects Revenues Will Reflect Slump

DCA said last week that it expects sales and earnings to reflect a summer slump for its PC products.

Sales of Crosstalk, Irma, and 10-Net products have been down and will result in a 15 to 20 percent decrease in revenues from the fourth fiscal quarter ended June 30. DCA expects the slowdown to be temporary.

Although most analysts say this is a typical slump for this time of year, Anthony S. Clark, a securities analyst for Wheat First Securities Inc., said he is concerned about the news not only for DCA but for the whole PC industry. "DCA is a bellwether for the industry because it has a broad base of products and it is very expensive in relating information about market demand," Clark said.

—Robert Snowden Jones

Micrografx to Introduce Designer Upgrade

Micrografx Inc. will introduce an upgrade to Designer drawing software and a new driver at next week's Seybold Desktop Publishing Conference. Designer, Version 1.3 will offer Extended Memory Specification (EMS) support for extremely large drawings that are limited only by available memory, the company said.

Designer is \$695, with upgrades priced at \$99 or fee to recent purchasers. The new driver for the Matrix Film Recorder will be included in Micrografx's Designer and Graph Plus products. It is available separately for \$200 for Excel, Gaskmaker, and other Windows applications.

—Paula S. Stone

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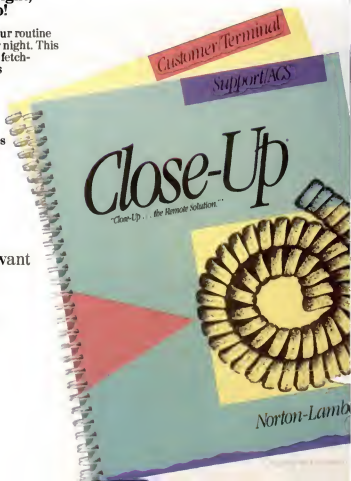
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Early DOS 4.0 Users Say 'Stay Away'

Microsoft Version to Resolve Incompatibilities

By Alice LaPlante and Stuart J. Johnston

Early users of IBM's version of DOS 4.0 say the incompatibilities are so irksome that they are recommending not upgrading until IBM provides fixes or ships the next release.

Microsoft acknowledged the problems, however, and said that when Microsoft OEMs ship their versions of DOS 4.0 — which is expected to begin by the end of 1988 — all such problems will be resolved.

"I don't have any plans to recommend it anytime soon," said Robert D. Holmes, com-

puter technology research analyst at Southern California Gas Co., in Los Angeles.

If there hadn't been any problems, Holmes would have recommended that his users upgrade to DOS 4.0 immediately, since the user shell would be "very valuable," he said.

InfoWorld published a First Look at DOS 4.0 several weeks ago and cited a number of serious incompatibilities, including the fact that the DOS shell in graphics mode is incompatible with most memory-resi-

dent programs — such as Sidekick Plus and Ready. In addition, the expanded memory driver was incompatible with programs such as Desqview and Paradox 386. (See "Incompatibilities Hinder Useful DOS 4.0 Features," August 15.)

"We started shipping four versions of DOS 4.0 to our OEM customers more than two weeks ago," said Pascal Martin, Microsoft's product manager for MS-DOS, who added that Compaq, Hewlett-Packard, AST, Dell, Zenith, and Tandy have received copies of DOS 4.0.

"Some of the problem fixes are already done, and some are being done," said Martin. "When Microsoft's OEM customers put it out, those problems will be fixed."

Many PC managers expressed disappointment that IBM went ahead and released DOS 4.0 when these incompatibilities were known.

"IBM has shown a general lack of sensitivity [by releasing software that causes problems]," said Holmes.

Ed Sund, senior systems engineer at Weyerhaeuser Corp., in Federal Way, Washington, has DOS 4.0 up and running and said he has "mixed emotions" about it. "I have yet to be successful in adding an application to the user shell and making it execute correctly," he said, adding that the documentation was poor.

"It's not clear to me that every single person is going to want [DOS 4.0]," said Bob Trexler, Above Board product line manager for Intel Personal Computer Enhancement Operation (PCEO), in Hillsboro, Oregon. "Several of our corporate customers are taking a wait-and-see attitude."

"I'm happy with the straight DOS 4.0 without the user shell," said Sund, who added he has yet to resolve "significant problems" with the shell.

3 Firms Agree to Develop Extended CD ROM Format

By Stuart J. Johnston

Philips, Sony, and Microsoft have agreed to develop an extended CD ROM format that will incorporate the audio and video capabilities of Compact Disc-Interactive (CD-I) and allow CD ROM and CD-I discs to be used on either type of disc player.

The new format, called CD ROM Extended Architecture (CD ROM XA), initially will allow CD ROM developers to use audio for applications such as tutorials, training discs, and point-of-sale catalog systems in record stores.

A second phase will define a standardized text and graphics screen format.

CD ROM (Compact Disc Read-Only Memory) was developed to allow storage of large amounts of computer-retrievable data on a read-only optical disc. On a PC CD-I, which has been demonstrated but is not yet commercially available, was created for interactive applications that run on a stand-alone player. The two

formats are currently not compatible.

"This is to try to get a lowest common denominator between the two," said Raleigh Rork, director of strategic planning for Microsoft's hardware division and former director of CD ROM research.

Rork cited the example of an encyclopedia stored in CD ROM XA format.

"On a CD-I system, you would just look things up, but on a PC, you could cut and paste [information] into a document on your word processor," Rork said.

Rork expects the audio portion of the specification to be published "very soon, certainly by the end of the year."

A draft specification for the text and graphics screen format on PCs is planned for distribution in late 1988, according to Rork.

CD ROM XA will probably be demonstrated at PC Expo in Chicago on October 10 to 12, Rork added.

Apricot Qi Series Is MCA-Compatible

By Tom Moran

BIRMINGHAM, U.K. — A series of six MCA-compatible systems with on-board VGA and Ethernet will be announced here today by Apricot Computers Plc.

Designed for networked environments, the Qi Series uses a MCA-compatible chip set from Chips & Technologies Inc., a Zenith BIOS, and processors ranging from the 16-MHz 386SX to the 25-MHz 386.

Storage devices range from one floppy disk drive to a 120-megabyte hard disk. The sys-

tems also have two serial ports and support direct X.25 communications, Apricot said.

They also have built-in security features for both stand-alone and networked environments. The Qi Series can access mainframes locally via Ethernet or remotely via a WAN.

Apricot will also announce Qi Environment, an "integral software solution" developed with Microsoft. Qi Environment is based on Presentation Manager for multitasking within DOS or OS/2. The software

complies with SAA.

"We are currently negotiating with IBM, and we are confident we will achieve all the licensing we will need," said James Blackledge, Apricot's vice president of corporate communications.

The price for the entry-level Qi 310 is £1,999, or about \$3,370; the Qi 660i costs £4,999, or about \$8,428. Slated to ship in October, the Apricot systems will be marketed in Canada by AIC Computers Inc. of Toronto, Ontario.

The Vectra QS/16 Product Line

Product	FEATURES			Price
	Floppy Disk (1.2MB, 5¼")	Hard Disk (40MB)	VGA Card	
Model 10	✓			\$3,995
Model 40	✓	✓		5,095
Model 46	✓	✓	✓	5,495
Model 47	✓	✓	✓	5,495

* 3½" Floppy Disk

All QS/16 models come with 1 megabyte of RAM and an extended keyboard. Monitors and video cards are available separately.

HP to Announce 16-MHz 386 Vectra QS/16 Line

By Bob Ponting

Hewlett-Packard Co. is scheduled to announce this week a line of 16-MHz 80386-based PCs designed for power users who want a small-footprint desktop machine.

The Vectra QS/16 series is as fast as HP's Vectra RS/16 tower model, but the entire package fits in the same desktop unit as the 286-based Vectra ES-12, said Bob Puette, general manager of the company's PC business unit.

The QS/16 models include a 386 processor with a 32-bit memory path that runs at 16 MHz with zero wait states, Puette said.

The machines have a standard, 8-MHz AT-compatible bus with one 8-bit and six 16-bit expansion slots. The unit can hold three half-height mass-storage devices, half the number available on the RS/16.

"People want a lot of power and don't need all the slots and the big power supply in the RS units," Puette said. The QS/16 fits very naturally in the Vectra product line, he said. It has the footprint of the ES/12 and the power of the RS/16.

The QS/16 will be competitive in price with the small-footprint Deskpro 386S, Puette said. But unlike the 386SX-based machine from Compaq, it will have a full 32-bit 386 processor.

The QS/16 line, which HP will ship this month, will be available in four models, Puette said. All models come with 1 megabyte of RAM, an EMS 4.0 driver for up to 16 megabytes of EMS, a serial and parallel port, an enhanced keyboard, and cables.

Monitors and video cards are available separately.

1-2-3 Ship Date to Help Lotus' Image, Not Sales

By Rachel Parker

CAMBRIDGE, MA — Lotus' current plan to ship its long-awaited upgrade to 1-2-3 late in the fourth quarter is expected to help the company regain user credibility, but some observers warn that the new Release 3.0 may end up missing the peak retail buying season.

In late August, Lotus tried to quell speculation of another serious shipping delay for Release 3.0 by saying it would be out "later rather than earlier" in the quarter.

The product has already been postponed once. In the spring, Lotus shifted the release date to the fourth quarter, conceding that development was more than six months behind schedule.

Since then, speculation about additional delays has been rampant. Release 3.0 is still too large, and Lotus won't be able to

ship both a DOS and OS/2 version in the fourth quarter.

While the recent statement can be viewed as a hedge, most observers believe the company will make its shipment date — if only to regain the credibility lost this year as new projects have been delayed or cancelled.

"Lotus has its reputation and credibility at stake," said Bill Higgs, a software analyst with Infocorp. "From that point of view, it won't matter if it ships in October or December."

But if the program does not ship until late in the fourth quarter, it will likely have little effect on Lotus' bottom line for the period. "Once they miss mid-October, the quarter is over," said Harvey Allison, a PC analyst with Waltheim & Co. "By mid-September, dealers are going to be making choices of what to buy from Lotus."

ROM BIOS Upgrade Corrects Bug in Dell System 220 PCs

By Paula S. Stone

AUSTIN, TX — Dell Computer Corp. last week announced it will offer a free ROM BIOS upgrade to owners of its System 220 with 1 megabyte of RAM.

BIOS, Version 1.1, which will be available to users who request it beginning September 15, corrects a BIOS bug the company said causes Dell System 220 PCs with 1 megabyte of memory to perform at slower speeds than machines equipped with 2 megabytes of RAM.

The performance discrepancy was discovered when users were unable to dupli-

cate benchmarks published by Dell when the 20-MHz, 286-based System 220 was introduced. "We tested the benchmarks with our most fully loaded and powerful machines to show what they could do," said David Frager, Dell product manager. "We didn't benchmark the System 220 with the 1 megabyte," he said.

"It was the first time we published benchmarks," said Dell spokesman Brian Fawkes. "We didn't specify the RAM memory of the units tested in the promotional brochure," he added.

The BIOS software upgrade will correct a bug that affects the power-on self-test routine when it sets up the system to handle 1 megabyte of memory, said Frager. The BIOS improperly configured the 1-megabyte systems to run at one wait state, he said. This made the 1-megabyte systems deliver lower benchmark ratings than System 220 PCs with 2 megabytes of memory — which the BIOS correctly set up to run with zero wait states, Frager said.

When Dell's published benchmark results could not be duplicated by users with 1-megabyte configurations, this uncovered the BIOS bug, Frager said. Once the new BIOS is installed, 1-megabyte systems can achieve nearly the same benchmark ratings as machines configured with 2 megabytes of RAM, according to Frager.

Apple Planning to Announce 68030 Version of Mac II

By Laurie Flynn and Nick Arnett

Apple Computer Inc. plans to announce on September 19 a 68030-based version of the Macintosh II with an optional floppy disk drive capable of reading DOS files, sources close to the company said last week.

Apple began briefing industry analysts on the new machine last week, the sources said. Although this is Apple's first use of the most powerful member of the Motorola 68000 microprocessor family, the new computer is essentially just a faster version of the Mac II, with new ROM firmware to support the new processor.

The standard configuration of the new machine will have 4 megabytes of memory and an 80-megabyte hard disk, sources said.

The Superdrive is a 1.4-megabyte floppy drive that will read and write Macintosh files and read DOS files, sources said.

According to earlier statements by Apple, a Mac II with a 68030 is considered an upgrade, rather than a new CPU.

The sources said that Apple's confidential briefings did not include the Mac SE 2/40, a new configuration of the Mac SE that had been planned for introduction at Macworld last month. Introduction of that unit, which comes with 2 megabytes of memory and a 40-megabyte hard disk, was canceled days before Macworld, sources said.

Current Mac II owners will be offered an upgrade to the 68030 microprocessor and the Superdrive, the sources said.

"This is the final part of John Sculley's commitment to standardizing on peripherals for the Mac that are compatible with IBM," said Ash Jain, president of Irvine Resource Group, in Irvine, California.

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Architech Readies OS/2 Version of News Interface

An OS/2 implementation of Sun Microsystems' News interface is scheduled for release this month from Architech Corp. of New York.

The \$495 News/2 is targeted for developers and end-users who want a consistent interface on a network that spans different operating systems, said Maurice Balick, Architech chairman and News/2 codeveloper.

"You could have a VAX, running a database application, talking to PCs on a network, all with the same News interface," Balick said. "A program on a Sun machine under Unix and News can also appear on any other News workstation in the network, whether it has Unix or not."

News/2 will coexist with Presentation Manager, running as a separate session on a window, Balick said.

The product is 100 percent compatible with News, licensed from Sun, and it is also Adobe Postscript-based, Architech said.

— Peggy Watt

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Robert Alonzo, Personal Computing

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William Zachmann, Computerworld

In the few years since Lotus Development Corp. introduced 1-2-3, many companies have attempted to unseat the king of the spreadsheet hill. The latest contender, Borland International Inc.'s Quattro, succeeds where other spreadsheet packages have failed . . . Quattro is at least two steps ahead of 1-2-3.

Ricardo Birmele, PCResource ”



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Most Companies Won't Adopt OS/2 Until 1990, Survey Finds

By Ed Scannell and Roberta Furger

The majority of large corporations won't begin the migration from DOS to OS/2 until 1990, according to a recent survey by Crwth Computer Courseware.

Released last week at the Information Center Conference and Exhibition in Boston, the survey contacted 475 information centers of large corporations, 60 percent of which were

Fortune 1000 companies.

Most attendees interviewed by *InfoWorld* said they are taking a "wait and see" approach to IBM's next-generation operating system. Indeed, none of the attendees has plans to implement OS/2 before 1990.

Most said they are waiting for a variety of compatible applications — which aren't expected

to be available before mid-1989 — before making the transition.

A lack of demand on the part of end-users and the high costs associated with upgrading both hardware and software were also cited as reasons for delaying purchasing decisions.

LOW TURNOUT AT OS/2 SESSION.
An attendee-organized session

on OS/2 plans and experiences drew only eight participants, each hoping to get more information on various issues involving migration. The handful of participants went away with most of their questions unanswered, however.

"I came [to this session] expecting to hear people talking about their experiences with OS/2 and their plans to upgrade," said one participant. "Instead, I found everyone else has as many questions as we do."

Michael Minkus, a specialist systems engineer in the computer support department of Texas Co. U.S.A., said that if an application "comes along under OS/2 that we can't do without, then we'll make the move. But as it stands now, we have no plans to do so."

"It is going to take good software to get me there," said John Hastings of Maine's Department of Administration, which has 15,000 PC users. "Something like what Visicalc did for DOS."

PREPARING FOR THE SWITCH. W.J. Jordan, communication services manager for South Carolina National Bank, in Columbia, S.C., said the development team has attended briefings on OS/2, adding that the South Carolina bank will "probably migrate to it eventually. Right now, the push isn't on, though. It's not a top priority."

Jordan added, however, that his department is rethinking its future hardware purchases to

ensure that products will have the capability to run OS/2 if the company does make the switch.

Lloyd Davies, senior systems analyst for Paccar Inc. of Renton, Washington, estimates it will be at least five years before his company moves to OS/2. "We'll want to make sure the operating system works and the software is available before we do anything," he said.

Mark Slaughter, IC manager for the Baltimore-based Fidelity and Deposit Co., said he's "waiting for all the bugs to be worked out" before recommending a move to OS/2. "Look at all the problems with DOS 4.0," he added. "And that's not even a new operating system."

EXCEL GAINING MARKET SHARE.

The Crwth survey also found that Microsoft's Excel is rapidly winning market share from Lotus 1-2-3.

According to the survey, Excel is expected to gain a 12 percent market share by the end of 1988, which will increase to 16 percent in 1989. Lotus' bestselling 1-2-3, which had a 59 percent market share in 1988, is expected to drop 4 percent in 1989 to 55 percent.

Recently, Big Eight accounting firm Deloitte, Haskins & Sells Inc. decided to standardize on Excel, as has the auditing department within Arthur Andersen. While some show attendees are currently evaluating Excel, none interviewed by *InfoWorld* had standardized on the product.

Mac Gaining Corporate Acceptance

By Ed Scannell and Laurie Flynn

BOSTON — The Macintosh is now officially supported by twice as many information centers as it was a year ago, according to a survey presented here at the Information Center Conference and Exhibition.

Despite this gain, Macs represent only 3 percent of all PCs purchased by the centers, indicating official support does not always translate into purchasing. "So many purchases take place without the ICs knowing it," said Tom White, CEO of Infonetics, in Santa Clara, California. "It may be officially

blessed, but people are still buying it the way they used to."

Twenty-four percent of the respondents said their organizations are maintained by Macs. The survey was done in 475 information centers at large corporations, 60 percent of which were Fortune 1000 firms.

Attendees substantiated a greater corporate acceptance of the Mac, with managers noting the Mac has grown beyond a desktop publishing machine and is now being used for many applications.

In a session titled "Apple or

IBM?" about 75 percent of the audience indicated their companies have Macs. And as the number of Macs increases, information center managers will be called on to provide more support, attendees agreed.

A recent survey by International Data Group found that 62 percent of all Macs sold to business in 1988 will go to small and medium-size firms with fewer than 1,000 employees and 25 percent will sell to businesses with fewer than 100 employees.

— Roberta Furger also contributed to this report.

Image Processors to Highlight Seybold

By Nick Arnett

New image processing software will highlight the products expected to be announced next week at the Seybold Desktop Publishing Conference, in Santa Clara, California. Among the companies unveiling new products are:

Knowledge Engineering of Greenwich, Connecticut, will announce a Macintosh II-based system to produce four-color, magazine-quality color separations in 20 minutes, using Ultraspeed's 3,000-dot-per-inch typesetter. The Color System 1 includes Lithographer, an image processor running under Multitasker that extends the Postscript language to handle color efficiently at a high resolution, the company said.

Systems — including the software, Nubus card, and typesetter — will cost \$30,000 to \$60,000 and will ship in limited quantities upon introduction.

Microtek Lab Inc. of Gardena, California, will introduce Picture Publisher, said to be the first gray-scale editing program for PC compatibles. It is scheduled to ship in mid-October and will cost \$595. Microtek will also introduce a \$500 Sun workstation interface for Microtek's MSF-300G and MSF-300C scanners.

Also to be unveiled is Laserbus, a PC add-on board with a printer and scanner interface, and memory to speed opera-

tions. A 1-megabyte version costs \$1,195; a 1.25-megabyte version costs \$1,295. The products are all scheduled to ship in mid-October.

Advanced Vision Research Inc. of San Jose, California, will introduce Softscribe, a Postscript interpreter for PC compatibles that prints Postscript files on non-Postscript printers by using AVR's Megascan card. It can also retrieve and store as a file the page bit map and reprint that file in as little as 10 seconds. AVR said, Softscribe, which includes 35 Bitstream Postscript fonts, costs \$575 and will be available immediately.

AVR also plans to announce development of a 2-megabyte version of the Megascan card that conforms to EMS 4.0 and is expected to ship in November.

Zsoft Corp. of Marietta, Georgia, will introduce an upgraded Publisher's Type Foundry that incorporates Compugraphic Corp.'s outline-to-raster techniques to more quickly clean up mishapen typefaces on PC compatibles. It eliminates manual cleanup of bit-mapped images generated from outline fonts and is scheduled for release in the second quarter of 1989, said Mark Zachmann, Zsoft chairman.

Olduvai Software Inc. of Miami plans to show Read-It 2.0 for the Macintosh and Read-It PC for PC compatibles. The

optical character recognition software can be trained to recognize new typefaces with 98 percent accuracy and can also read fax files, Olduvai said. Each package costs \$395. The new Mac version is scheduled to ship in early October and the PC version in December.

Ducupo Inc. of Mountain View, California, will introduce a version of its Professional Publishing System for the Sun Microsystems 386i workstation. It features publishing by example, import and export filters, and intelligent tables. It will be available upon introduction at an undetermined price.

Calera Recognition Systems, formerly Palantir Corp. of Santa Clara, California, plans to introduce Truescan, a desktop text and graphics recognition system.

E-Machines Inc. of Beaverton, Oregon, will introduce the Z21 SE 21-inch monochrome monitor, a Macintosh SE version of its Mac II 21 monitor. It comes with software and firmware to switch among 36-, 40-, 72-, and 80-dpi resolutions and supports hardware panning to move around a large virtual image at high speed. It is scheduled to ship in early November. The price is not set but will be near the \$2,495 cost of the Mac II version, the company said.

— Robert Snowden Jones contributed to this report.

MCA

Continued From Page 1

was an easy decision for customers who had already committed to the Micro Channel Architecture to make," said Gary Kleine, president of Office Automation Center, part of Today's Computer Business Centers, in Lexington, Kentucky.

"The majority of our customers who purchased the original Model 50 have already switched over," agreed Richard Rose, president of DataFax Corp., an Edison, New Jersey-based dealer chain.

In the month of July — less than a month after its introduction — the Model 50 Z sold 10,000 units, Storebrand's Stahel said. "That's impressive for such a new machine," he said.

The Model 70, on the other hand, only sold 4,000 units during that month, Stahel said.

There are several reasons for the Model 70's slow start, dealers said.

"We have little to no sales activity in the Model 70, mostly because people are confused at the different functionality of

ferred by Models 70 and 80," said Rick Mathis, president of The Computer Shoppe, in Nashville, Tennessee.

"When you get into the more powerful and expensive machines, large corporations have an initial waiting period before they can purchase a new machine," said DataFax's Rose. "It takes 60 to 90 days before a new machine gets evaluated and put on a corporate standards list."

Surprisingly large numbers of Model 60s are being bought, dealers said, and sales of the original Model 50 continue to be strong.

However, IBM continues to lose market share. During July over 221,000 PCs were sold through the retail channel, said Stahel, which means that IBM commanded approximately 33 percent of the market in July 1988. In July 1987, IBM held 37.5 percent of the market.

Where IBM lost, Compaq and third-party PC vendors gained, with Compaq moving from 14.7 percent of the market in July 1987 to 17 percent of the market in July 1988. Sales of "other" PCs rose from 27.8 percent in July 1987 to 34.8 percent in July 1988.



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News Briefs

Novell Passes Over its Server Line to Samsung

As expected, Novell Inc. is passing marketing and distribution responsibility for its server product line over to Samsung, the Korean manufacturer of the line.

This move follows Novell's similar transfer a week ago of its 286 PC Terminal to Samsung. Servers involved are Novell's 286A, 286B, 386A, and 386AE.

Novell Lowers Prices Of Network Care, SR5

Novell has cut prices on both Network Care, a LAN management and diagnostics package, and Service Response System (SR5), a LAN database and call-management package. Network Care Level I will now cost \$195, while Network Care Level II will cost \$495. SR5 Module I is \$995.

Novell has also detailed support for IBM's DOS 4.0. The Network Workstation Shell Kit for DOS 4.0 costs \$500 and includes an unlimited user license.

Novell Inc., 122 E. 1700 S., Provo, UT 84601; (800) 453-1267.

Company Unveils New PC Anywhere Version

Dynamic Processor Associates Inc. has announced PC Anywhere III, a new version of its remote computing package. The \$145 package now includes automatic call-back from the host machine to the remote PC, call logging, automatic record and playback, and the capability to remotely access and control a PC using a Mac.

Dynamic Microprocessor Associates Inc., 60 E. 42nd St., New York, NY 10165; (212) 687-7115.

Cayman Releases Its Intelligent Gateway

Cayman Systems Inc. recently released its intelligent gateway connecting networks and Ethernet networks.

The \$3,495 Gatorbox lets Macs access Ethernet devices.

Cayman also plans support for Token Ring, FDDI, and twisted-pair Ethernet.

The unit includes a motherboard with a 68000 processor and 1 megabyte of RAM, two net interface cards, and networking software.

Cayman Systems Inc., 1 Kendall Square, Building 600, Cambridge, MA 02139; (617) 494-1999.

'User Friendly' Network Manager Set to Debut

Product Protocol-Independent

By Mark Stephens

Users looking to maximize the performance of their local area networks but are daunted by the user-unfriendliness of most protocol analyzers will soon have Lanprobe, a protocol-independent network management system from Eon Systems Inc.

The company will introduce the product at the TCP/IP Interoperability Conference, to be held September 27 to 29 in Santa Clara, California.

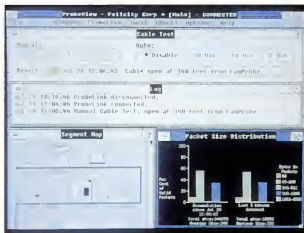
The Lanprobe system includes dedicated hardware and Microsoft Windows-based Probeview software running on an IBM AT or compatible, constantly monitoring events on an Ethernet segment, according to Eon president Joseph Adler.

Network management has tended to be reactive, waiting for some problem to crop up before analysis tools are brought

in," Adler said. "Our idea is to make network management proactive by having a permanently attached unit that constantly monitors the network segment, detecting problems as they happen and bringing them to the network administrator's attention."

Probeview software logs network statistics such as collisions, errors, or broadcast packets, said Mary Gardner, Eon's director of marketing. Valid packets, broadcasts, multicasts, CRC errors, runts, and jabbers can all be displayed as trends shown in terms of packets, bytes, percentage of utilization, or percentage of traffic.

Should any parameter exceed a preset threshold, Lanprobe alerts the user and logs the event, Gardner said. Network mapping, logging, tracing, cable



Lanprobe's Probeview software can run its network analysis tools concurrently and display them simultaneously as windows.

testing, and statistics gathering all take place concurrently and can be displayed simultaneously in separate windows.

Build-in TDR circuitry can test network wiring as often as every three minutes, detecting breaks and reporting their location on a graphical display of network devices, Gardner said.

The network administrator's workstation can be linked to the Lanprobe hardware through the Ethernet, through an RS-232 port in the event of a network failure, or remotely through a modem, allowing analysis of networks at practically any distance, Gardner said.

Stanford University is a Lanprobe beta test site, where Raman Khanna has been using the product since June. "It's a

very useful tool, and we especially like the friendly user interface," said Khanna, who is manager of Stanford's Systems & Technology Group. "Most of our department network administrators aren't very technical, and they love the graphical display. The TDR capability is also very useful and not found in most protocol analyzers."

Lanprobe will ship in October at a hardware cost of \$8,000, according to Gardner. Probeview software costs an additional \$5,000 for a license that allows the user to monitor an unlimited number of Lanprobe units.

Eon Systems Inc., 10601 S. De Anza Blvd., Suite 303, Cupertino, CA 95014; (408) 252-5440.

Application Connection Features New Interface

By Ed Scannell

Lotus Development Corp. released last week a significantly enhanced version of its micro-to-mainframe communications product, featuring a new interface and compatibility with its Blueprint data architecture.

Release 5.0 of The Application Connection (TAC) has a new interface that makes it easier for micro users to locate data on a mainframe, said Scott Eliot, TAC's product manager.

Through the Catalogue Facility, users can point to desired catalog entries that display textual descriptions of their contents. To select specific records, the Selection Assistant helps users choose a field name and operand, such as "greater than," and a comparison field or value.

"TAC gives users a set of automated tools within 1-2-3 so they can build their own requests to the mainframe," Eliot said. "It also ensures that MIS [managers] remain in data administration and not in program development."

TAC's improved data aggregation capabilities allow users to summarize data during the extract process, receiving only the data they need without having to search through volumes of irrelevant data. This capability also reduces the load on both mainframes and networks.

The upgraded program features the Sequential-Access Method (SAM) Connection, allowing selective access to se-

quential data from multiple sources, which gives users only the records and fields they want. As most data can be presented sequentially, the SAM Connection offers an entry point into most mainframe environments not directly supported by TAC.

Release 5.0 now supports the company's Blueprint data architecture, which allows users of future Lotus applications containing Blueprint to use TAC to access mainframe databases.

Using 5.0 reduces the CPU access time and elapsed time required to access mainframe data, Eliot said. In previous versions it took TAC 27 seconds to perform a DB2 select and extract of 100 records. The same task now takes three seconds.

TAC 5.0 will ship in two phases. The first phase, beginning in the fourth quarter, includes connections to DB2, SQL/DS, Focus, SAM, as well as 1-2-3/Symphony.

Phase two will include the 1-2-3 Connection, Release 3.0 and will ship early next year. The program costs \$40,000 and includes a VM or MVS version, the SAM Connection, a 4GL/DBMS connection, PC software, installation, and support. Current TAC users can upgrade for free.

Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500.

IBM, University Will Build Nationwide Academic Net

By Alice LaPlante

PITTSBURGH — IBM and Carnegie-Mellon University announced last week plans to build a prototype for an experimental nationwide computer file system that would allow academic researchers — and eventually businesses — to exchange computer programs, messages, or spreadsheets in seconds.

The Andrew File System (AFS) will be used as a base for the new file system, with representatives from both Carnegie-Mellon and IBM saying they hope it will eventually become a standard.

"A national file service could revolutionize the work environment," said Alfred Z. Spector, director of the Information Technology Center at Pittsburgh, Pennsylvania-based Carnegie-Mellon.

The Information Technology Center was created in 1982 by IBM and Carnegie-Mellon to develop Andrew — a large distributed computing system for educational computing.

According to Spector, the AFS will permit thousands of

authorized computer users to share data and program files stored by other organizations, even if the files are across the continent. "This is the first shared file system with the capability to handle many users separated by huge distances," he said. "AFS should also provide a valuable additional service on the emerging nationwide computer networks."

AFS is a collection of communication and computational resources serving as the information-sharing core of a user community and the backbone of Andrew, Spector said. AFS has been used at Carnegie-Mellon since 1985 and has more than 1,000 computers attached with 8,000 accounts.

The people who will initially benefit from the nationwide network will be scientists sharing computer programs and experimental data, Spector said. But people in large companies will find it easier to share items such as spreadsheets, manuscripts, and schedules, he said.

See Andrew, Page 16

Metaphor DIS Turns ATs Into Workstations

By Mark Stephens

Corporate users of the Metaphor Data Interpretation System (DIS) can now avoid having two screens on each desk, and save \$1,400 per user, by buying a kit from Metaphor Computer Systems Inc. that turns existing IBM ATs or full compatibles into Metaphor workstations, while retaining full PC functionality.

The Metaphor DIS is a system of graphical workstations, database servers, file servers, and host communications servers used to gather, analyze, and present data from multiple, independent databases. Typical DIS users are large corporations attempting to do "what if" analyses of mainframe data that would be unwieldy in its native



Using Metaphor's WS 2XP conversion kit, a networked IBM AT or compatible can become a full-functioned Metaphor workstation.

form. Metaphor's Workstation 2XP takes full advantage of the company's icon user interface and includes a 68000-based coprocessor board with 2 megabytes of on-board memory and an Ethernet adapter, a 15-inch multisync color monitor, a three-button mouse, and diagnostic software and drivers. The Workstation 2XP runs as a DOS

application, and users can switch between DOS and Metaphor sessions.

The Workstation 2XP is available now for \$2,100, according to Metaphor. In contrast, a dedicated Metaphor workstation costs \$3,500.

Metaphor Computer Systems Inc., 1965 Charleston Road, Mountain View, CA 94043; (415) 961-3600.

Company Ships Family of X.25 Software

By Mark Stephens

A family of X.25 software products offering synchronous terminal emulation, local area network gateways, and remote host connectivity are now shipping from Emerging Technologies.

All of the products are de-

signed to work with Western Digital Corp.'s WD4025A X.25 adapter board, according to the company.

"We have a development system that allows programmers to take full control of Level 3 of

the X.25 protocol, and these end-users products were written with that development system," said Dennis Baasch, president of Emerging Technologies.

"While this approach puts more load on the host processor, it offers a much more powerful interface and allows products like these that take full advantage of X.25's multiple connection capability," Baasch said.

Emerging Technologies' ET/Multi-Term is a \$300 multichannel X.25 terminal/PAD emulator that provides multiple simultaneous terminal sessions with a CCITT X.3/X.28/X.29 PAD interface, according to the company. The product includes VT-100 emulation, interactive X.29 commands, the capability to send and receive files, as well as remote DOS command execution. LAN-Gate software, included with ET/Multi-Term, converts the PC into an X.25 gateway.

ET/V-Text is a \$695 menu server that allows access to all X.25 network services without users having to remember network address and special call parameters, Baasch said. It allows the PC to act as an X.25-based menu-server host with videotext-type features for directing callers to other hosts and services with centralized password protection.

ET/X25-Print allows a PC to act as a multichannel print server over multiple X.25 lines at speeds of up to 64 kbps, Baasch said. The \$195 product accepts incoming calls and buffers data for multiple output devices.

Emerging Technologies, 101 Jackson Ave., Suite 3L, Minneapolis, MN 55401; (612) 742-2375.

Lanfax/10 Brings Fax Capabilities to E-Mail

By Mark Stephens

Alcom Inc. recently announced Lanfax/10, an AT-based facsimile communications server that offers fax or telex destination capabilities to users of 3Com Corp.'s 3+Mail or Action Technologies Inc.'s Coordinator electronic mail package running on Novell networks.

"At a time when most fax board manufacturers think of LAN compatibility as meaning that installing their board in a workstation won't crash the network, we are offering seamless communication to two million fax machines, 1.7 million telex addresses, and thousands of EMS mailboxes worldwide, all from within an existing E-Mail application," said Jeffrey Harrison, Alcom's president.

Lanfax/10 is a shared store-and-forward system, allowing every workstation on the LAN to have fax capability through a single Intel Connection Coprocessor board supporting the new DCA/Intel Communicating Application Specification, Harrison said. (See "Intel, DCA Run Data-Link Spec Up the Flagpole," August 22.) The system supports message queuing and name service. Incoming faxes

must be scanned by a network administrator and directed to their appropriate user mailboxes.

"Through the store-and-forward concept, we are able to use a dedicated phone line nearly 100 percent of the time, delaying the need and cost of a second line," Harrison said. When multiple lines are needed, it is possible to install additional coprocessors in the gateway PC, Alcom said.

The Lanfax/10 installation package includes an Intel Connection Coprocessor board, Lanfax/10 service module, Easygate Communications Server Platform software, and a Message Transfer Agent Interface for either 3+Mail or Novell's Message Handling Service, Alcom said.

The Lanfax/10 installation package costs \$1,795 and will be available next month, Alcom said. A software-only version of the product for users who already own Connection Coprocessors will be available for \$895.

Alcom Inc., 2464 Embarcadero Way, Palo Alto, CA 94303; (415) 493-3800.

Data Switch Shipping Intellinet 4200 Series

By Mark Stephens

Data Switch Corp. is shipping a new family of network performance measurement systems offering new hardware, new software, greater diagnostic capabilities, and greater ease of use than earlier systems, according to the company. The Intellinet 4200 series offers interactive communications with IBM's Netview/PC network management system.

Intellinet 4200 monitors in

real-time an entire network down to the device level, as well as applications down to the transaction level, said Fred Dietz, Data Switch's president. It graphically displays the results in color codes that indicate immediate or impending problems so corrective action can be taken, allowing operators to fine-tune networks.

Intellinet 4200 software features a multitasking operating system called EOS, which supports diagnostic data capture, automatic configuration, and user-definable databases. The system can simultaneously capture data on a line and continue to monitor that line, while automatically configuring and automatically maps new devices that are added to the network.

The Intellinet 4200 family uses a 68000 processor and a VME bus and has 80 to 240 megabytes of hard disk capacity, depending on configuration. The Model 4205 supports 16 to 96 lines, while the Model 4215 supports up to 512 lines. Prices start at \$21,000 and run to more than \$100,000 for very large networks.

Data Switch Corp., 1 Enterprise Drive, Shelton, CT 06484; (203) 926-1801.



The Intellinet 4200 offers IBM Netview/PC compatibility.

Attachmate Releases Documentation for API

By Mark Stephens

Software developers who want to write micro-to-mainframe communication applications using IBM's 3270-PC Application Program Interface (API) can do so now with the help of documentation for the API, newly available from Attachmate Corp. in its API Programmer's Toolkit. Documentation for the API has not previously been available from IBM.

The API Programmer's Toolkit, which is available immediately, contains both documentation and working sample programs that use the Application Program Interface, according to Attachmate.

The 3270-PC API was originally developed by IBM for its special-purpose 3270-PC, which has since been discontinued by the company. The API continues to be available with IBM's 3270 Workstation Program and Attachmate's Extra Connectivity software.

Unlike IBM's High-Level Language Application Program Interface (HLLAPI) and Server Requestor Programming Interface (SRPI), the 3270-PC Appli-

cation Program Interface is written in assembler, offering speed and memory advantages over the other APIs. Until now, however, programmers have not been able to easily take advantage of this low-level API because of a lack of documentation from IBM, according to Mike New, Attachmate's vice president of marketing.

With more than 50 major functions, the 3270-PC API can be used to develop software that goes beyond terminal emulation, automating many procedures and insulating the user from an awkward host/user interface. "Now programmers can put the PC processor to work to improve the way people actually use the mainframe," New said.

The 3270-PC API is covered in Volume II of Attachmate's API Programmer's Toolkit, according to New. Volume I contains documentation and sample programs for HLLAPI and SRPI. Volumes I and II cost \$195 each.

Attachmate Corp., 13231 S.E. 36th St., Bellevue, WA 98006; (206) 644-4010.

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DTK Computer Shipping \$295 Ethernet Adapter Card for PCs

Pushing the price level for Ethernet adapter cards ever lower, DTK Computer Inc. said it is shipping a \$295 adapter card for IBM PCs, XT's, AT's, and compatibles.

DTK's PCI-003 is a half-slot card with both an on-board thin Ethernet transceiver and an

Attachment Unit Interface connector for an external thick Ethernet transceiver, according to Tom Bayens, a spokesman for DTK Computer.

The PCI-003 is certified compatible with Novell Inc.'s Netware network operating system, though DTK does not ship

Netware drivers with the card, Bayens said. A maximum of 100 stations per Ethernet trunk segment are recommended for networks using the card.

The card comes standard with squelch circuits to minimize noise and with 32-bit CRC check and regeneration, according to the company.

DTK Computer Inc., 15711 E. Valley Blvd., City of Industry, CA 91744; (818) 333-7533. — Mark Stephens

Device Sends Data to HP Laserjet II at 57.6 KBPS

By Mark Stephens

Claiming to set new speed records for data transfer to a Hewlett-Packard Laserjet II printer, Gilttronix Inc. announced it is shipping its EQZ Laser II printer sharing device,

which allows up to five PCs to share the printer and sends data at up to 57.6 kbps.

In addition to the 300-per cent speed increase from earlier versions of the product, EQZ Laser II offers 256K of buffer RAM expandable to 1.25 megabytes, according to Gilttronix.

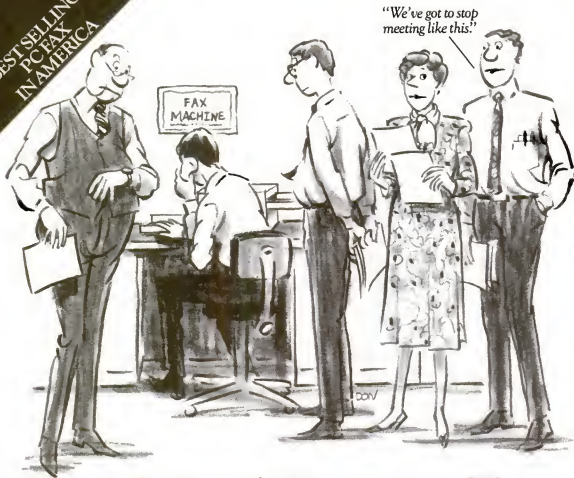
The product also incorporates Datasafe, a new error detection/correction feature intended to make the unit highly immune to external noise sources while maintaining high throughput, the company said. Datasafe is designed to work with Gilttronix's new EQZ utility software, which supports 57.6-kbps operation on the unit's four serial ports.

A command protocol allows users to order multiple collated copies of output and to set independent end-of-job timeouts, according to Gilttronix. Four serial ports and one parallel port on the unit can be independently programmed with customized setup routines.

The EQZ Laser II, which costs \$495, is available immediately, Gilttronix said.

Gilttronix Inc., 1430 O'Brien Drive, Building D, Menlo Park, CA 94025; (415) 853-1800.

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Continued From Page 11

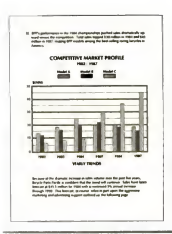
More importantly for business users, the system will make evaluating and testing software easier since programs can be executed directly from a software vendor's machine, Spector said.

IBM and Carnegie-Mellon currently are working with 10 sites to set up a prototype geographically distributed file system based on AFS. The system is designed to support large numbers of clients' multi-vendor computer workstations. Organizations would maintain their own file storage systems.

"The development of AFS is synchronized with the rapid growth of high-speed local area networks as well as wide area networks," said Robert Mazza, director of development for IBM technical computing systems.

Currently the system is experimenting with file service to MIT and the University of Michigan. The local area network version of AFS was released by IBM earlier this year to support computer workstation users and is being used by many leading universities and other research organizations such as Dartmouth College, Pennsylvania State University, and the National Institutes of Health, said Mazza.

What if...



Connections

By David J. Buerger



Switched ASCII Networks Are an Alternative to SNA

The most popular way to connect terminals and PCs to an IBM mainframe is through a Systems Network Architecture network. SNA networks are complex and expensive. Considering the tasks most people perform on SNA networks, one has to ask why people don't use simpler connectivity schemes.

For example, corporate staffers who use IBM mainframe services typically look up or enter data, or print reports. Most do not require a graphical interface. Slow data transfer rates (9,600 to 19,200 bps) are adequate for these tasks.

Second, organizations frequently move personnel. Most companies do not pre-wire required coax cabling to every location where these workers might go. This is expensive and difficult to plan. Old buildings make it hard to pull a widespread coax cable plant. Twisted-pair extensions with balun connections are possible but aren't always practical.

Third, remote SNA hardware configurations often require several extra data transfer steps compared to simpler switched layouts.

A simpler additional SNA network presumes you have a large IBM or compatible host as its hub. Local or short-distance links go through a channel-attached IBM 3274 cluster controller. The 3274 feeds up to 32 coax cables to IBM 3278 terminals or to PCs with 3278 emulation boards. DCA's Irma board is an example of the latter device.

Local attachments can allow access to all host facilities. Typically, only the computer center staff gets local attachments.

Remote links are more complex. The channel-attached controller runs Network Control Program (NCP) software. A synchronous modem connects to this controller via an RS-232 connection.

This modem transmits data over twisted pair to another synchronous modem at the remote location. Data transfer rates can vary between 9,600 and 56,000 bps. The remote modem then links to a 3274 cluster controller. The remote 3274 lets up to 32 3278 terminals and PCs with emulation boards link in via coax cabling.

PCs on a Token Ring local area network can link to the IBM host via an IBM 3174 cluster controller.

A simpler alternative to the SNA network is to link ASCII terminals and PCs to the IBM host through a data PBX. My last two columns outlined the cost/performance benefits of a data PBX vs. a LAN. The same benefits extend to many applications even in an SNA environment.

Reliable ASCII terminals can cost less than \$500. Many people prefer to use a clone PC with terminal emulation software. A PC gives users the added bonus of doing things that a mainframe cannot do, but either device provides a low-cost way to link

to the IBM host.

This method has clear advantages over remotely attached 3278 terminals. The latter are usually dedicated to specific tasks on the host. ASCII terminals or PCs have no such limitations. The PBX can switch them to the IBM host for VM/CMS sessions or VTAM sessions on multiple guest machines. It also can link to other hosts, to other PCs, to shared printers, or to a modem pool.

IBM PCs do not use ASCII input. This means the PBX cannot directly link to the IBM. A channel-attached IBM 7171 provides automatic protocol conversion of ASCII input to IBM's EBCDIC format.

We decided to use this scheme over a year ago to link 90 users to an IBM 4381. Instead of the 7171, however, we bought a Hydra II from JDS Microprocessing of El Torero, California. The channel-attached Hydra unit configures in sets of eight ASCII ports up to a maximum of 64.

In addition to linking terminals and PCs to the IBM, the Hydra lets you assign ports dedicated to inexpensive ASCII printers. These appear to the host as CICS or channel-attached printers. This is true whether the printers reside across campus or across the continent. A software vendor in Pennsylvania regularly dials through a leased line and mux into the 4381 via our PBX and Hydra for a "channel-attached" 9,600-bps link.

The 7171 has one microprocessor for its 64 ports, while the Hydra has one for every eight ports. This provides greater reliability for file transfers and channel-attached printers.

Since local SNA environments don't provide fixed-device addresses, switched ASCII setups that behave like local environments may cause network management problems. For example, some PBXes randomly assign callers to a port on the protocol converter. To complicate matters, IBM's VTAM randomly assigns virtual terminal addresses. This makes it difficult to know which people are using specified resources.

Since IBM sells the 7171, one could say IBM "supports" the switched ASCII strategy. It's rare, however, to find the economical and efficient data PBX/7171 combination used instead of an SNA network.

A switched ASCII network doesn't need modems or have line contention, and it gives local channel-attached performance to any device anywhere on the planet. It delivers the benefits of an IBM host without communication controllers, synchronous modems, coax cabling, dedicated terminals, SNA, NCP, or VM/CNA.

David J. Buerger is director of the Personal Computer Center at Santa Clara University in California. E-Mail comments may be sent to: dbuerger@scu.blnet or MCI Mail ID 304-0160; start the MCI 'Subject' line with HASCI01Buerger. The views expressed are his own.

• TECHNICAL ISSUES

Black Holes, Packet Storms: The Trouble With Large LANs

By Mark Stephens

While the average LAN has fewer than 10 nodes, the trend is toward larger networks that turn out to have larger problems, say experts in the business of installing, and fixing, large networks. Typical of burst-traffic difficulties on these networks are packet storms and black holes.

Packet storms are a major problem affecting Ethernets running TCP/IP, according to Mike Watters, chief software architect for Eon Systems Inc., a manufacturer of network analysis products.

"A packet storm can start in many ways — from a wild adapter card spontaneously sending out thousands of malformed packets, for example," Watters said. "A bad packet — say, one lacking a good Ethernet address — can confuse the other devices attached to the net."

BAD PACKETS. "Not recognizing the packet, these devices respond either by suggesting to the other devices what they think the packet really is or with a query," Watters said.

"If the packet is malformed for some reason, the network gets really upset and a flurry of queries and ideas passes across the network from every device to every other device, and back," Watters said. "If the Ethernet adapter cards in use are not intelligent — if they rely on the PC processor to look at every packet — then both the workstations and the network slow down as a greater and greater percentage of the load is taken up by the packet storm."

Packet storms typically happen

every 30 seconds on a large network. Watters said, and while they subside in a few seconds, they can be a major overhead concern for large networks.

"When networks grow to much more than 40 nodes, problems of this sort can cause throughput to drop off rapidly," said David Ferris, president of Ferris Network Integration, a firm responsible for setting up many large corporate networks.

"The only answer at that point to this problem of burst traffic," Ferris said, "is a change of topology along with routers or repeaters with active filters between segments to remove the bad packets."

BLACK HOLES. Unlike a packet storm in which there is a bad Ethernet address for an errant packet, black holes are typically started by the introduction of a packet with a good Ethernet address and a good IP address, but the IP address doesn't happen to exist on the network, according to Watters.

Circulating through the network, this packet causes a string of routing errors that in turn circulate, ultimately causing a whirl of circling packets — a black hole — that uses up network resources until it is eventually timed-out by the network and dies away.

Sophisticated protocol analyzers can detect and monitor just the sort of packets responsible for packet storms and black holes, according to Ferris, helping network administrators to both find and remove consistent sources of bad packets and to understand just how afflicted a large network can become.

Fibermux Releases AUI, Fiber-Optic Versions of FX701 Ethernet Repeater

By Mark Stephens

Fibermux Corp. is now shipping AUI cable and fiber-optic versions of its FX701 Ethernet repeater, which is capable of extending or linking Ethernet segments over distances from 100 meters to as much as 2,800 meters.

The FX701-L is a short-range repeater that links two remote segments up to 100 meters apart, using standard AUI cables, according to Richard Bass, Fibermux's vice president of marketing. Where such a link might often require a repeater on each end of the connecting cable, users can do the same job with a single FX701-L by positioning the repeater in the middle of the link, connected to Ethernet segments on either end through AUI

cables up to 50 meters long, he said.

For distances greater than 100 meters or when users demand the security features of a fiber-optic link, Fibermux's FX701R can link two remote Ethernet segments that are up to 2,800 meters apart, according to the company.

Used in pairs, the FX701-Rs come with thick and thin Ethernet interfaces so that either type of Ethernet cable at one end can be linked to either type at the other end. The connecting fiber-optic cable can be either single or multimode, with SMA- or ST-type connectors.

Both repeaters are available now in stand-alone versions or in card versions that fit in the Fibermux FX120 12-slot chassis, according to the company. Prices range from \$1,250 for the card version of the FX701-L to \$3,400 for the top version of the FX701-R.

Fibermux Corp., 9428 Eton Ave., Chatsworth, CA 91311; (818) 709-6000.



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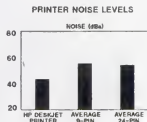


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News
BriefsMultiplication for OS/2
Ships From Microsoft

Microsoft is now shipping its first OS/2 application, Multiplan 4.0, which runs under both DOS and OS/2.

The spreadsheet also supports EMS 4.0, which has database functions that track text and list-oriented data through the spreadsheet, the developer said.

Multiplan can run multiple spreadsheets under OS/2, linking them to handle large worksheets. It can also link to graphics created with Microsoft Chart.

Upgrades cost \$65 with a new manual or \$50 for the supplemental pages only. Users who acquired the program after June 15 can upgrade for free.

Microsoft Corp., 16011 N.E. 36th Way, Redmond, WA 98073; (206) 882-8080.

Transpower Releases
Math Problem-Solver

Expert Thinker, an advanced theorem-proving program that uses logical reasoning rather than heuristic algorithms for solving problems from Transpower.

The program, written in Prolog, can solve problems in logic, mathematics, and science using first-order predicate calculus. It features true negation, non-Horn clauses, staged depth-first searches, and Meson reduction, the developer said.

The \$149 program runs on PS/2 and PC compatibles with 640K and DOS 2.0.

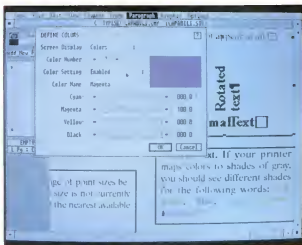
Transpower Corp., 1 Oak Drive, Parkerford, PA 19457; (215) 495-6362.

Mapwise Analyzes,
Graphs Data Relations

Market Action Research Software is shipping Mapwise, which analyzes data relationships and shows correlations as scattergrams.

The statistical package is geared to market research and advertising, said Betsy Goodnow, MAR's president. It can show links of brand names with product images and analyze market segments and customer response. The program uses multiple dual scaling and multiple proximity analysis.

The \$495 program runs on PS/2 and PC compatibles with 256K. A free demo disk and a \$9.95 limited-feature version are also available. Market Action Research Software, Bradley University, Business Technology Center, Peoria, IL 61625; (309) 677-3299.



Ventura Publisher 2.0 lets the user vary color by a percentage, save the specs under any name, and implement them in the text.

Ventura Publisher 2.0
Offers Table-Making

By Bob Ponting

An updated Ventura Publisher, Version 2.0, and its Professional Extension add-on will hit the streets this month, to be followed later this year by a network version that supports file locking and shared printing, Xerox Corp. said last week.

The new Ventura products have more than 100 new features, ranging from interface improvements to new technical publishing functions, said John Meyer, president of Ventura Software, which has a marketing alliance with Xerox.

Many of the powerful new features are available only with the \$595 Professional Extension to ensure the base product retains its \$895 price and still runs well on 8088-based systems, Meyer said. These include a table-making feature; vertical page justification; support for EMS 4.0; a 130,000-word hyphenation dictionary; symbolic referencing of pages, chapters, sections, and illustrations; and automatic typesetting of mathematical equations.

Several sources familiar with the product were most impressed with the table-making feature, which lets users generate an expandable array of cells and create tables from data files. "While [the option] is called 'table,' I'll bet you see a lot of people using it to generate forms," said one user.

The Ventura Publisher Network Server lets multiple workstations share a single copy of the application, Meyer said. It supports file locking and a read-only function, so several users can see a document while one edits. It also compresses print files and tracks downloaded fonts, Meyer said. The first network version will support Novell Network, 3Com, and IBM PC Net. It costs \$1,295 for one workstation, and users can add more workstations with single copies of Ventura 2.0.

Other enhancements to Version 2.0 are support for spot-color separations, 500 shades of gray, and displaying and printing TIFF gray-scale images. It also displays Encapsulated Postscript (EPS) files with TIFF or Windows Metafile images and uses the bit maps to print EPS files on non-Postscript printers.

Ventura's new EMS support provides access to 32 megabytes to process longer and more complex documents, making the program a feasible tool to publish catalogs, phone books, and other large documents.

Ventura can also mix text rotated to any 90-degree increment on the same page, although many printers do not yet support the feature, according to Meyer.

Amy Wohl, a Pennsylvania-based office automation consultant, called the update a "successful continuation of the most successful product in its market segment," but she said such high-end products as Interleaf still lead Ventura in graphics tools and document management.

Posix Is Government's Portability Choice

By Scott Mace and Stuart J. Johnston

With the stroke of his pen, the U.S. secretary of commerce is expected to soon change the way computer applications are created and used in the federal government.

The signature will open the floodgates for a variety of federal contracts to require compliance with Posix, a functional interface between operating systems and applications, which is officially called the Portable Operating System Interface for Computer Environ-

SPC Readies Entry-Level
'First Graphics' Program

Targeted at Occasional Users

By Bob Ponting

Software Publishing Corp. plans to release this month an entry-level business graphics product to complement the high-end Harvard Graphics.

PFS First Graphics is targeted at occasional users who need to produce higher-quality graphics than those available with Lotus spreadsheet features, but don't want to master a full-featured graphics package, said Cary Fulbright, assistant product manager for Software Publishing.

The program lets users combine text and graphics to create a variety of color graphs and charts, Fulbright said. Users simply choose a chart option and fill in the corresponding template. Users can preview and modify charts on-screen before printing.

First Graphics supports bullet lists, free-form text charts, pie charts, column start, horizontal and vertical bars, area charts, line charts, and scatter graphs. Bar charts can be clustered, overlapped, stacked, or combined with line graphs.

The program can generate

two- or three-dimensional bars, columns, and pies. It can connect data points in a line graph with straight lines or generate trend lines or smooth curves. It can also create linked pie and column charts.

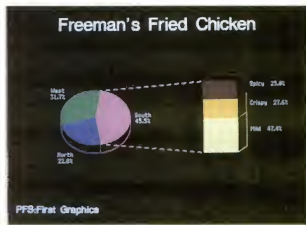
First Graphics supports five text fonts in several sizes and up to 16 screen colors. Users can change program defaults for colors, fill patterns, fonts, and chart styles at any time.

First Graphics can also create charts directly from Lotus and Symphony worksheets and export its charts to files created by Software Publishing's Harvard Graphics and Professional Write.

It can print three charts per page and it supports plotters, printers, and Postscript output, as well as high-speed draft copies.

The program costs \$149 and runs on PC or PS/2 compatibles with 320K of RAM, a graphics card, and DOS 2.0 or later.

Software Publishing Corp., 1901 Landings Drive, P.O. Box 7210, Mountain View, CA 94039; (415) 962-8910.



Software Publishing's PFS First Graphics offers a powerful but entry-level set of graphics tools and modifiable chart templates.

of software engineering at the Institute for Computer Sciences and Technology (ICST). His organization is the computer-related arm of the National Bureau of Standards (NBS), which recommends and implements standards for federal agencies.

More than 50 companies endorsed Posix when it was first proposed as an IEEE standard. (See "50 Companies Endorse Standard Unix Version," February 9, 1987.)

See Posix, Page 26

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spreadsheet for an unprecedented fifth straight year by the NSTL.⁽²⁾ In fact, 1-2-3 is the backbone of business, with over 7 million users who depend on it everyday.

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(1) Upgrade offer valid September 6, 1988 through 30 days after the 1-2-3 Release 3 ship date. (2) National Software Testing Laboratories, Inc. Software Digest Ratings Report, June, 1988.(3) 1-2-3 system requirements will vary from Release 2.01 to Release 3. 1-2-3 Release 3 runs under DOS and OS/2. Hard disk and 640K required. Lotus certified compatible PC, with 80286 processor or better recommended. Lotus and 1-2-3 are registered trademarks of Lotus Development Corp. dBase is a registered trademark of Ashton-Tate Corporation.

Expert System Products Lead Announcements at AI Show

By Stuart J. Johnston

ST. PAUL, MN — Expert system building products were among the new or updated tools leading announcements at the recent conference of the American Association for Artificial Intelligence Seventh National Conference here.

IBM announced it will ship next March its Expert System Consultation Environment/PC (ESCE/PC). The package will let users run on stand-alone DOS-based IBM XT, AT, or PS/2 systems an expert system application that was created on an IBM mainframe using

IBM's Expert System Environment.

The ESCE/PC will also offer external interfaces to programs written in assembly language, Pascal, or C. One copy of ESCE/PC will be provided free to each current or new licensee of the Expert System Environment; additional copies will cost \$595 each.

Information Builders, developer of the Focus fourth-generation language and database management system, announced that a fourth-quarter release of its Level 5/PC expert system software will support Microsoft Windows.

CIM Solutions demonstrated Version 1.5 of its Socrates knowledge base management system. The new version, scheduled to ship in October, adds more menu options, more extensive search capabilities, support for multiple knowledge bases, and the capability to cut and paste between trees. A single-user package will cost \$495.

IBM Corp., 900 King St., Rye Brook, NY 10573; (914) 934-4843.

Information Builders Inc., 1250 Broadway, New York, NY 10001; (212) 736-4433.

CIM Solutions, 2696 N. University Ave., Suite 280, Provo, UT 84604; (801) 374-5626.

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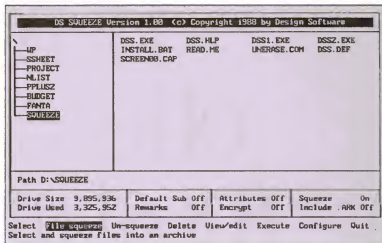
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749 Brunswick Street
San Francisco, CA 94112



Design Software's Squeeze program lets users view and manipulate files as well as compress them by as much as 75 percent to save disk space and speed transmission.

DS Squeeze Compresses Files By Up to 75%, Developer Says

A menu-driven file compression utility that is said to boost hard disk capacity as much as 75 percent has been introduced by Design Software.

By compressing files, DS Squeeze eliminates the need for the need for larger disk drives and provides speedier transmission because files are smaller.

DS Squeeze can shrink a 100K DOS file to less than half that space in three seconds, according to Design Software. Its Execute option can activate executable files such as .COM, .EXE, and .BAT, even after the files are compressed and archived.

The program offers a directory tree display that lets users tag files in one directory, squeeze them, and move the compressed files to another directory. It has a point-and-shoot interface, user-alterable default settings for all program options, and a user-definable squeeze directory that contains all archive files.

Also included is a proprietary encrypt function that lets users encode, decode, and password-protect files. Users can add up to 10 lines of notes to each archive file and can print reports of archive directory contents.

The \$59.95 program runs on PS/2 or PC compatibles with 256K of RAM.

Design Software Inc., 1275 W. Roosevelt Road, West Chicago, IL 60185; (312) 231-4540.

— Scott Mace

Updated Query Lets Users Perform SQL Queries, QBE Techniques on 1-2-3 Files

An update of Quadbase Systems' Query now lets users perform SQL queries and QBE (query-by-example) techniques on Lotus 1-2-3 files.

Query, Version 2.1 also lets users join 1-2-3 and Dbase III files transparently and save query results in 1-2-3 file formats, according to the developer. Users can create, update, and manipulate data files within Query, which includes a multiple-window environment and pull-down menus.

Query already works with Dbase files. ("Query Allows SQL Query of Dbase Files," May 23.) It consists of a relational database engine, an SQL interface, a QBE interface, and a report writer.

Other enhancements in Query 2.1

include support for the SQL "alter table" statement, arithmetics on date fields, and group by month or year. It imports ASCII files and can open as many as 32 database files at once.

Quadbase also released Query/Lib 2.1, a set of routines that can be called by Microsoft C and gives developers access to Query's relational database engine.

The \$150 Query 2.1 requires a PC compatible with 512K of RAM and includes a royalty-free run-time version of Query/Lib 2.1, which includes Query 2.1, costs \$295.

Quadbase Systems Inc., 790 Lucerne Drive, Suite 51, Sunnyvale, CA 94086; (408) 738-6989.

— Scott Mace

Wordware Publishing Releases Trio Of Books for Desktop Publishing Users

Wordware Publishing has released a trio of books to guide users selecting and learning a desktop publishing system.

The *Handbook of Desktop Publishing: A Guide for Business and Professional People*, by John C. Sans, covers the tools, techniques, and purposes of desktop publishing. It provides information on Macintosh and IBM equipment, checklists, and cost justification formulas to help users decide whether and how to set up an in-house system.

The series also features two tutorials with step-by-step training that describe common functions and commands and offer tips and shortcuts.

Illustrated Pagemaker, by Phyllis Moore, provides samples of real business

applications for the software, and *Illustrated Ventura*, by Robert Kerstetter, describes the program's functions. The books cost \$19.95 each.

The seventh edition of *The Business Software Catalog* is now available from International Database Management Association. The \$39.95 catalog describes 1,500 business and government software packages in 200 application categories.

Wordware Publishing Inc., 1506 Capital Ave., Plano, TX 75074; (214) 423-0090.

International Database Management Association Inc., 10675 Trenea St., Suite 103, San Diego, CA 92131; (619) 578-3152.

— Paula S. Stone

Mind Path Ships Tools Enhancing Laser Printers

A desktop publishing package for Hewlett-Packard laser printers is now shipping from Mind Path Technologies.

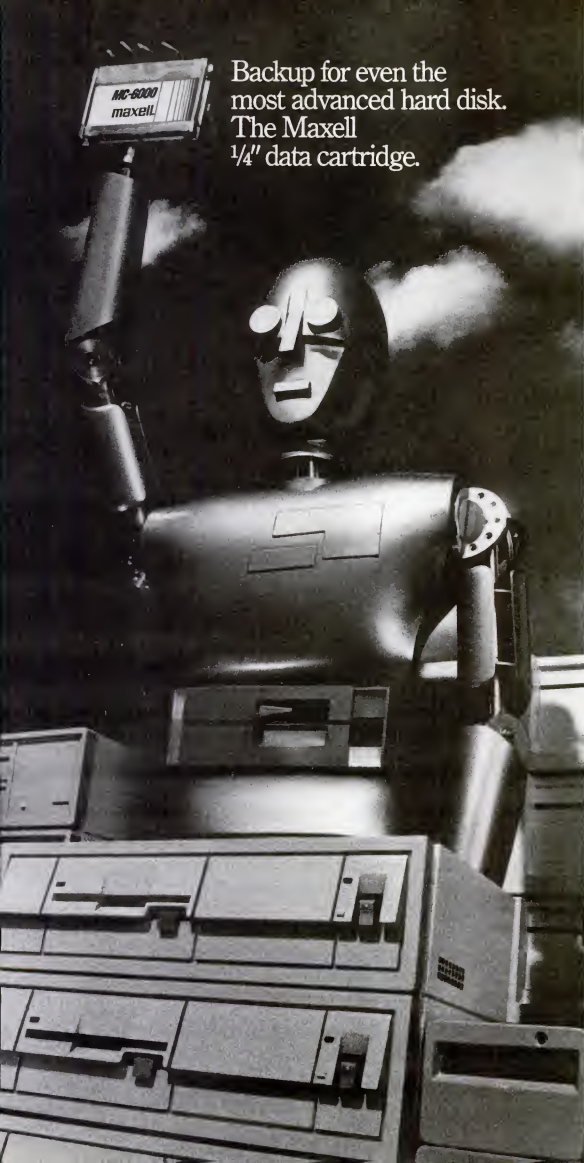
Laser-Ready provides 30 fill-in-the-blank business documents and more than 50 built-in software fonts. Its spreadsheet and report-printing utility can print Lotus .WK5 files and other documents using Laser-Ready fonts.

Laser-Ready's four-step process lets users create and print business documents such as letters, envelopes, business forms, mailing labels, resumes, and business cards. Sample paper, film, and labels to test documents for printing are included in the \$89.95 package.

Laser-Ready runs on PC compatibles with 512K, DOS 2.1 or later, and a CGA, EGA, or Hercules display. It is compatible with HP Laserjet Series II laser printers and compatibles.

Mind Path Technologies Inc., 12700 Park Central Drive, Suite 1801, Dallas, TX 75251; (214) 233-9296.

— Paula S. Stone

A large, stylized robot with a metallic, somewhat abstract face and a body composed of various mechanical parts and panels. It is holding a Maxell MC-6000 1/4 inch data cartridge in its right hand. The background is a dark, cloudy sky.

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Posix

Continued From Page 21

Applications created under Posix today would still have to be recompiled to run on other Posix-compliant systems, Martin said. "Posix defines the operating system level interface, but there are a lot of other areas that also need to be addressed."

To accomplish that end, NBS has created what it calls an Applications Portability Profile (APP), an evolving set of coordinated standards that eventually will cover database management, graphics, network file systems and file services, and user interfaces.

It will also specify programming languages other than C, including Cobol, Fortran, Pascal, and Ada. Real-time and transaction processing issues are also being discussed by the IEEE committees set up to address all of these issues, Martin said.

BRINGING POSIX TO OS/2. More importantly, several prominent developers have announced plans or are rumored to have plans to support today's Posix interface in other operating systems. Digital Equipment Corp. has acknowledged plans to make its VMS operating system Posix-compliant. Microsoft Corp.'s Bill Gates announced last month that OS/2 will be Posix-compliant in versions scheduled for release in the second half of 1989.

"The most efficient way of implementing a Posix layer on top of OS/2 is to use [an] installable file system [IFS]," said Paul Srihibhaddh, director of Xenix development and marketing at Microsoft.

"With IFS you can have multiple file systems installed simultaneously," said Mark Mackaman, Microsoft OS/2 product manager. "You could conceivably run OS/2 and Posix applications at the same time."

A Posix-like file system could also be created using dynamic link libraries (DLLs), Srihibhaddh said.

DLLs are loaded dynamically, Mack-

aman said. "The beauty [of OS/2] is if it's not needed, it's not loaded in."

AGENCIES CONTROL USE. Federal agencies have a wide amount of discretion about when and how they implement Posix.

"From a user perspective, the goal is to increase the capability to move applications from one environment to another," Martin said. "The goal is a 100 percent capability to do that. Realistically, I doubt that I'm ever going to see that in my lifetime."

Posix-compatible systems may not have performance as good as operating environments fine-tuned for particular hardware, Martin said.

But over time, software developers may be able to isolate those performance

the mammoth AFAC 254 procurement.

Under its predecessors, the U.S. Air Force, Navy, and others have bought more than a quarter of a million microcomputers in the past three years.

"There are already RFPs [Requests for Proposals] or drafts of RFPs out on the street that specify Posix," Martin said. "There are a number of them that are sitting there and waiting for the FIPS to be signed, and then I think you're going to see an explosion of them," Martin said.

Vendors may still face some confusion, however. The NBS-recommended FIPS specification is based on the IEEE Draft 12 but includes a few features of Draft 13, which is expected to be

said David Jacobsen, coordinator of the Washington-Area Microcomputer Managers Organization, in Washington.

"Rather than the operating system being the unifying factor, I think applications software is going to end up being the unifying factor. The idea of running one operating system across all environments is not necessarily good. For example, there are a lot of things Unix does not do well. It does not do on-line transaction processing well at all. It does not handle nonstop operations that minimize data loss. Security is full of holes."

But some software developers are optimistic that Posix can't hurt and can probably help.

"Right now it's a multimonth effort for us to start from the top of our 170-vendor list of hardware to go to the end of it," said George Billman, government marketing manager of Informix Software Inc. of Menlo Park, California. "Once the various vendors we work with become Posix-compliant, it will probably telescope our porting effort dramatically."

POSIX AND OS/2. Further enhancement of Posix will also bring the NBS and IEEE work closer to the work being done by the Open Software Foundation, which is considering adopting some of the same standards.

"In the user interface area, our intention is to propose the adoption of the X Window specification as an interim FIPS," Martin said. "We're trying to wait until there is a good stable draft of proposed standards with the intention that, as the standards bodies complete their work, we will revise the FIPS to bring them in line."

If OSF or the X Consortium come up with a good consistent definition that covers all aspects of user interfaces, including a common "look and feel," we would be very interested in adopting that, but that's something down the line," Martin said. "When you talk to the users, they say they want a common look and feel, but the problem is getting to that definition."

— Martin Marshall also contributed to this story.

In theory, Posix will give application developers a helping hand in porting their commercial software from one Posix-compliant system to another.

areas and still take advantage of Posix compliance for the bulk of their applications code.

As Posix is revised and its capabilities expanded, federal agencies will be urged to make it mandatory where possible, Martin said.

And while today Posix is most frequently found in the Unix operating system, the Federal Information Processing Standard (FIPS) about to be declared by the commerce department also states Posix is applicable to all systems acquired by federal agencies that require Posix-like functionality, which includes everything from mainframes to PCs.

Agencies and vendors will determine which operating systems deserve Posix compliance. But one strong indication of how quickly Posix may appear on — or at least influence — PCs is that the U.S. Air Force will require Posix compliance in "Desktop 3," the follow-on contract to

accepted by the IEEE until this fall.

DEVELOPERS DISAGREE ABOUT BENEFITS. In theory, Posix will give application developers a helping hand in porting their commercial software from one Posix-compliant system to another.

But developers must also weigh the performance limits of Posix vs. the portability it allows.

"Posix adds only a minimum level of compatibility among different systems," said Bruce Cleveland, Unix marketing director at database developer Oracle Corp., in Belmont, California. "Since our software is complex and touches on different areas, I doubt it will give us a real head start on any system. For instance, Posix doesn't address shared memory capabilities of the hardware," Cleveland said.

"Commercial software is now migrating from one environment to the other,"



Editor's Choice,
Project Management. 1986.



Editor's Choice,
Project Management. 1987.

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Range of learning	(12%)	Very Good	Very Good	Good	Very Good
Range of use	(15%)	Good	Very Good	Very Good	Excellent
Error handling					
Data integrity	(7%)	Very Good	Very Good	Very Good	Very Good
Error messages	(2%)	Good	Good	Good	Very Good
Support					
Support policies	(5%)	Good	Good	Very Good	Excellent
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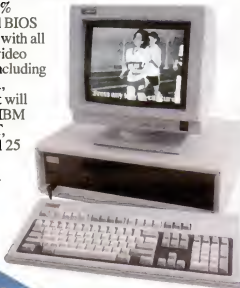
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News Briefs

Unisys Lowers Prices Of PW2 Workstations

Unisys Corp. last week announced price cuts ranging up to 19 percent on its 286- and 386-based Personal Workstation 2 (PW2) workstation series.

The 386-based PW2 Series 850 Basic System, which includes 1 megabyte of RAM, a 1.2-megabyte floppy disk drive, one parallel and two serial ports, and EGA/MGA graphics—went from \$5,080 to \$4,318. The Series 850 Deluxe System, which adds a 69-megabyte hard disk drive, was reduced from \$7,885 to \$6,702.

The 20-MHz 386-based Series 800 Basic System went from \$5,590 to \$5,025. It includes the same features as the Series 850. The deluxe Series 800, with a 69-megabyte hard drive, fell from \$8,385 to \$7,525.

Unisys also cut prices on its 286-based Series 500 line of computers and diskless workstations and on hard disk drive options and EGA displays for the PW2 family. Unisys Corp., P.O. Box 500, Blue Bell, PA 19424; (215) 542-4000.

DTK Offers Motherboard To Upgrade AT Systems

Users of full-size ATs and compatibles can upgrade their systems with a 386 motherboard recently introduced by DTK Computer Inc.

Featuring the Intel 80386-20 microprocessor, the PEM-2000 motherboard is AT compatible and can be configured with up to 8 megabytes of memory, the company said. Switch-selectable between 8 and 20 MHz, the PEM-2000 is equipped with one parallel and two serial ports, a socket for an optional 80387-20 20-MHz math coprocessor, 640K of RAM, 384K of extended memory, and eight expansion slots. The expansion slots include one 8-bit, five 16-bit, and two 32-bit slots, according to the company. The motherboard also provides users with direct memory access (DMA) and a three-channel timer for sound and clock.

The PEM-2000 motherboard is now shipping and costs \$1,795 without DRAM.

DTK Computer Inc., a division of DataTech Enterprises Co. Ltd., 15711 E. Valley Blvd., City of Industry, CA 91744; (818) 333-7533.

Intel PCEO Boards to Provide 8MB of RAM for OS/2, LIM 4.0

By Tom Moran

Intel Corp.'s Personal Computer Enhancement Operation (PCEO) is scheduled to introduce today three add-in boards capable of providing up to 8 megabytes of memory for OS/2 or LIM 4.0 memory under DOS.

The Above Board 2 Plus, intended for the IBM PS/2 Models 50, 50 Z, and 60, conforms to IBM's guidelines for addressing more than 2 megabytes of RAM on a single board, according to Bob Trexler, product manager for Intel's Personal Computer Enhancement Operation. It can hold 2 megabytes when populated with 256K SIMMs or up to 8 megabytes with 1-megabyte SIMMs,

the company said.

The Above Board 2 Plus lists for \$495 with no random-access memory and for \$795 with 512K installed. Available now, it replaces the current Above Board 2, according to the company.

The Above Board Plus and the Above Board Plus I/O, which are both intended for PCs, XTAs, ATs, PS/2 Model 30s, Compact 386s, and compatible systems, can hold 2 megabytes of RAM or a total of 8 megabytes using an optional 8-megabyte piggyback board. The Above Board Plus I/O also includes one serial and one parallel port.

The suggested retail price of

the Above Board Plus

is \$795. The Above Board Plus I/O will retail for \$945. Both come with 512K of RAM. The optional piggyback board, compatible with both new boards and the existing Above Board 286, will sell for \$2,195 and include 2 megabytes of RAM, the company said.

PCEO also announced a LIM 4.0 hardware upgrade program for owners of the Above Board 286 who use Windows 2.0 or Desqview 2.2. The upgrade will replace a custom chip on the



Above Board 2 Plus provides up to 8 megabytes of RAM for PS/2 Models 50, 50 Z, and 60.

board. To be available from October 3 through December 31, the \$100 upgrade will include chip pullers, an installation manual, upgraded software, and reference manuals.

Intel Corp., Mail Stop C03-07, 5200 N. Elam Young Parkway, Hillsboro, OR 97124; (503) 629-7354.

Genicom Model 1040 Prints at 432 and 90 CPS

By Julie Webber

Genicom Corp. recently announced a 24-wire printer designed for word processing, graphics, and spreadsheet applications.

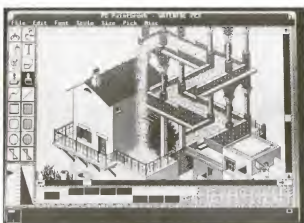
Called the Genicom Model 1040, the printer is capable of printing 432 characters per second in high-speed mode and 90 characters per second in letter-quality mode, the company said. The device can print at either 10 or 12 characters per inch and emulates the IBM Proprinter XL24 and Epson LQ 2500, according to the company.

The Model 1040 printer also includes zero-inch tear-off, which is ideal for demand docu-

ment printing applications, according to the company. Other features of the Model 1040 include automatic paper parking, which allows cut sheets to print without having to unload and reload continuous tractor-fed forms. The Model 1040 also handles forms of up to five parts, using rear tractor paper feed and comes with elite, brougham, italics, subscript, and superscript resident fonts, according to the company.

The Genicom Model 1040 is now shipping and costs \$1,799, the company said.

Genicom Corp., Genicom Drive, Waynesboro, VA 22980; (800) 535-4364.



Ovonic Imaging's active-matrix monochrome LCD is 1.2 inches deep and features a contrast ratio of 20-to-1.

Firm Ships Prototype Of Active-Matrix LCD

By Julie Webber

Prototypes of an active-matrix monochrome LCD are now shipping to the military in limited quantities from Ovonic Imaging Systems Inc.

Although not yet scheduled, shipments of the new device will eventually go to computer manufacturers for use in laptop computers, according to the Troy, Michigan, company.

The display is based on the active-matrix design, which uses a solid-state control switch at each pixel location. The display is equipped with a proprietary amorphous silicon alloy switch, which is made up of a pair of thin-film diodes, at each liquid crystal pixel, the company said. In the event a diode may be "shorted," there are three series of redundant thin-film diodes at each pixel, and the rows and columns are on different substrates to avoid insulated crossovers, the company said.

The 6-by-8-inch VGA-compatible display features a resolution of 640 by 480 pixels and a contrast ratio of 20-to-1, the company said. Measuring 1.2 inches deep, including its fluorescent backlight, the Ovonic display takes up much less space than CRTs with equivalent display areas, the company said. Future versions of the Ovonic display could provide gray-scale and full-color operation when appropriate drive circuitry and color filters are added.

"We've talked to a number of computer makers," said vice president Lionel Robbins. "However, it's not appropriate to identify them now." The display that is shipping to the military is being used in an unidentified battery-powered portable computer. Currently, the display would be too expensive to put into laptop computers, a company spokesman said.

Oak Products to Let Firms Build PS/2 Compatibles

By Julie Webber

Oak Technology Inc. recently announced a family of products, including a VLSI chip set, a system BIOS, and software modules, intended to let board- and system-level manufacturers build systems compatible with IBM's PS/2 Model 30s. Among Oak's expected customers is American Mitac Corp., which has announced a Model 30-compatible system.

The product line includes the OTI-031 System Controller, which supports 8086 CPUs at both 8 and 10 MHz; the OTI-033 Floppy Disk Controller; the OTI-034 Buffer Driver; the

OTI-036 Color Palette; and the OTI-037 VGA Controller.

Sample quantities are available now; full production is to begin in the fourth quarter of 1988. Oak also announced it is developing a chip set to support 80286-based Model 30s, to be available at the end of 1988.

In an agreement with VLSI Technology Inc. of Tempe, Arizona, VLSI will provide manufacturing capabilities, while Oak will grant VLSI marketing rights for its Model 30 chip set.

Oak Technology Inc., 2041 Mission College Blvd., Suite 245, Santa Clara, CA 95054; (408) 727-9648.

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Controllers Offer High-Speed
Graphics for PCs and PS/2s

Firmware Supports DGIS Applications

By Paula S. Stone

High-performance graphic controllers for AT-bus and Micro Channel Architecture-based personal computers have been introduced by Control Systems.

The Artist Designer 16 and the Artist Designer 16 MC offer a standard operating resolution of 1,664 by 1,200 pixels for monochrome applications.

Both controllers are designed to support a number of software applications and operating environments. Both use the Texas Instruments TI 34010 graphics system processor (GSP) chip. The GSP performs algorithms and other processing tasks on the add-in board to free the host CPU to perform other tasks, according to the company. This allows the Artist Designer 16 to offer high-speed graphics capabilities and support for C and other high-level programming lan-

guages, the company said.

The Artist Designer 16 and the Artist Designer 16 MC have on-board firmware that supports the Direct Graphics Interface Standard (DGIS) developed by Graphic Software Systems. The DGIS support provides drivers for a number of graphics and desktop publishing programs, including Autocad, Versacard, Pagemaker, and Ventura Publisher. It also supports GEM, Version 2.0 and later and Microsoft Windows, Versions 1.01 and 2.0.

Software-selectable options for the Artist Designer 16 include 1- or 2-bit-per-pixel operation. The 1-bit-per-pixel option supports a display window of 4,096 by 1,536 pixels, while the 2-bit-per-pixel option supports a window with 2,048 by 1,536 pixels of displayable memory,



The Artist Designer 16 MC offers a resolution of 1,664 by 1,200 pixels.

according to the company.

The Artist Designer 16 MC offers only the 2-bit-per-pixel operating mode, with a display window of 2,048 by 1,536. It displays four shades of gray on a page-size monitor at about a 150-dot-per-inch resolution.

Available now, the Artist Designer 16 and Artist Designer 16 MC controllers are priced at \$3,995 each and come with the user's choice of drivers.

Control Systems Inc., 2675 Patton Road, St. Paul, MN 55113; (612) 631-7800, (800) 826-4281.

System Captures Voice Data for PC Programs

By Carole Patton

Verbox Voice Systems said it will introduce next month a continuous speech input/output system that captures voice data for PC applications using technology acquired two years ago from Exxon's speech-recognition division.

Planned for September releases are voice-activated package-handling and

manufacturing software applications for the system. The system essentially replaces a PC's keyboard and turns voice input into an ASCII stream in tasks where hands or eyes are busy, such as quality control and materials handling.

Moreover, the system can be used with radio headphones so operators are

not "tied" to a PC. The system also provides voice output via a speech synthesizer chip capable of 60 seconds of text-to-speech voice for confirming the accuracy of data already entered.

The system has an active vocabulary of 100 words, recorded by the user on ROM cartridges using CMOS technology. Users "train" the system to recognize a speaker by repeating words and numbers twice, then they download the "active" vocabulary into a ROM cartridge. Up to six ROM cartridges can be plugged into a Verbox system, which is essentially a front-end voice recognizer. Voice data is fed back to the PC as an ASCII stream.

Additionally, vocabularies can be expanded by linking ROM cartridges. The system connects to a PC through a communications link or a standard PC bus. It can communicate with LANs and other hosts by daisy-chaining via an RS-232 port.

The Verbox system will be available in September and include a voice-recognition preprocessor, proprietary speech-recognition software, a ROM-resident operating system, and ROM-resident training software. It will cost \$5,600.

Voiceware, used to provide the "grammars" that define an application's vocabulary, is available for package-handling and manufacturing functions. The package-handling cartridges include Inventory Counter, Mail Accountant, Mail Sorter, Package Sorter, Returned Goods Receiver, and Voice Shipper.

The manufacturing cartridges include Inspector, Inventory Counter, Quality Controller, Voice Shipper, Process Controller, Material Controller, and Returned Goods Receiver. Voiceware software ranges in price from \$350 to \$900 per cartridge. In addition to grammars, Voiceware includes voice templates and a menu-driven voice developer for creating training scripts and documentation.

Verbox Voice Systems Inc., 185 Ridgeway Ave., Cedar Knolls, NJ 07927; (201) 267-7507.

according to the company.

The lower prices for the keyboards are effective immediately. The prices were cut as a result of increased production volumes for the RX series, according to Honeywell.

Honeywell Inc., Keyboard Division, 4171 N. Mesa St., Building D, El Paso, TX 79902; (915) 543-5504.

— Paula S. Stone

Monotype to Exhibit Postscript RIP
For Lasercomp Series of Typesetters

Monotype Inc. will demonstrate a new Postscript raster image processor (RIP) for its Lasercomp line of typesetters at the Seybold Desktop Publishing Conference next week.

The Monotype Postscript RIP supports output resolutions from 300 to 2,400 dots per inch and is built around Adobe's Atlas Plus controller, said Alison Bond, Monotype's director of marketing.

The Atlas Plus runs Postscript, Version 47A on a Motorola 68020 processor with 640K of ROM and 8 megabytes of RAM. The Monotype RIP also incorporates an 80-megabyte SCSI hard disk that will hold up to 1,000 font descriptions.

The RIP comes with three resident font faces from Adobe and two from

Monotype's library, Bond said. Any font from the Adobe or Monotype libraries can be downloaded to the unit.

The RIP was designed for traditional publishing operations that now need Postscript compatibility for some of their pages, Bond said. The unit can be dynamically enabled and disabled, so users can print both Postscript and Monotype Input Command Language files on the same Lasercomp imagesetter. The \$19,500 RIP will be available as an add-on or will be bundled with Lasercomp systems in January 1989.

Monotype Inc., 2500 Brickvale Drive, Elk Grove Village, IL 60007; (312) 350-5600.

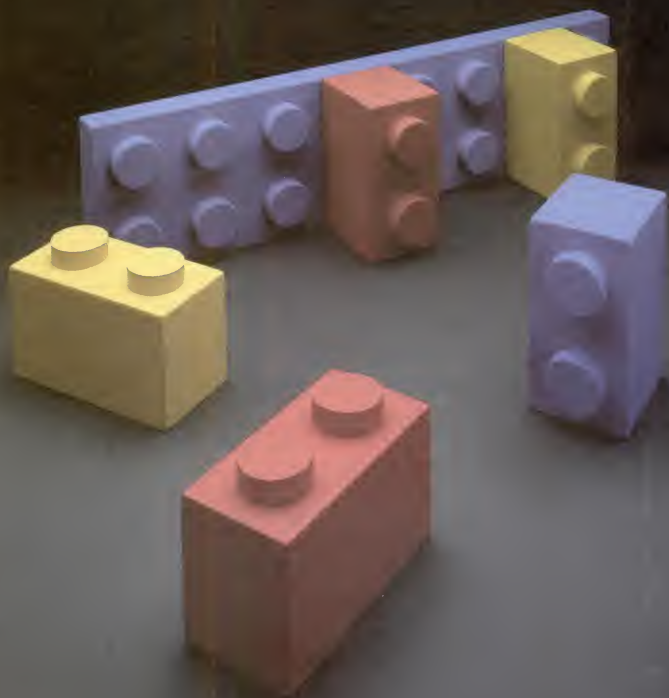
— Bob Ponting

Honeywell Announces Price Reductions
On Its 84RX and 101RX PC Keyboards

Price reductions on the 84RX and 101RX IBM PC-compatible keyboards were recently announced by Honeywell Inc.

Honeywell's RX series of keyboards features a curved form with tactile feel. The 84RX keyboard is now priced at \$119, having been reduced from \$129. Honeywell's 101RX keyboard now costs \$149, a reduction in price from \$175,

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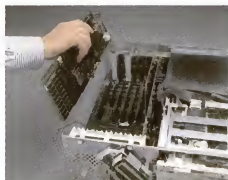


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Intex Unveils Spreadsheet Font Cartridge

Intex Solutions Inc. recently unveiled a font cartridge designed to let users print a 50,000-character spreadsheet on a single page.

The Spreadsheet Font Cartridge works with Hewlett-Packard's LaserJet printers. The cartridge includes five type fonts, which the company said are ideal for printing large spreadsheets. Each font provides type of 3, 4.8, 6, 8.4, and 10 points.

Capable of supporting printing in

either portrait or landscape mode, the spreadsheet cartridge also allows users to print the Lotus maximum of 240 characters per line and up to 50,000 legible characters on a single page, the company said. Users can reduce the amount of paper required to keep archival hard copies of their spreadsheets.

The font cartridge is compatible with Intex's Jetset, a software add-in package for Lotus 1-2-3 that provides menu-driven control of the laser printers from Hewlett-Packard, according to Intex Solutions.

Available now directly from the company, the Spreadsheet Font Cartridge costs \$199.

Intex Solutions Inc., 161 Highland Ave., Needham, MA 02194; (617) 449-6222.

—Julie Webber

CATI Introduces High-Res Monitor for CAD, Desktop Publishing Applications

Computer Applications Technologies Inc. (CATI) recently introduced a 14-inch paper-white graphics monitor designed for applications such as CAD and desktop publishing.

The CATI1024 is a high-resolution graphics display subsystem with a 1,024-by-768-pixel resolution mode and a Hercules-compatible 720-by-348-pixel resolution mode. The flat-screen monitor maintains a one-to-one aspect ratio in either resolution mode, according to CATI. The monitor has a 29-kHz horizontal scan rate and a 72-hertz vertical scan rate.

The CATI1024 subsystem includes a

half-height controller board that incorporates a parallel port for PC, XT, and AT compatibles or the PS/2 Model 25 or Model 30. Driver software for applications such as Ventura Publisher, GEM, Microsoft Windows, and Autocad is shipped with the package, according to the company.

The \$595 monitor can coexist with a color graphics adapter as either the primary or secondary display system, CATI said.

Computer Applications Technologies Inc., 16840 Joleen Way, Building B, Morgan Hill, CA 95037; (408) 778-2287.

—Bob Ponting



The CATI1024 is a 14-inch flat-screen monitor with paper-white phosphor.

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Comram/4 Adds 4MB of Memory To Compaq 386

Clearpoint Research Corp. will begin shipping in September a 4-megabyte add-in memory module for the Compaq Deskpro 386/20 and 386/25 personal computers.

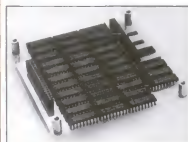
The Comram/4 memory module uses 1-megabit 100-nanosecond DRAMs and lets users upgrade Compaq machines to the maximum of 16 megabytes. The 16-megabyte capacity is achieved when three Comram modules are combined with Compaq's optional 4-megabyte motherboard. Storage of 13 megabytes can be reached when three modules are added to the standard 1-megabyte motherboard, the company said.

The Comram/4 memory module also supports parity error-checking for added reliability, Clearpoint said.

The Comram/4 is scheduled to be available starting in late September and will sell for \$2,399. The Comram/4 module will also include a lifetime warranty, Clearpoint said.

Clearpoint Research Corp., 99 South St., Hopkinton, MA 01748; (617) 435-2000.

—Julie Webber



The Comram/4 adds 4 megabytes of RAM to 386-based systems from Compaq.

Data Switches Let Users Share Printer, Plotter

By Julie Webber

Two computer users can share one parallel printer or plotter with Computer Accessories Corp.'s two new data switches.

Called the Data Director Model Q200 and Q2000, the data switches work with the IBM PC, XT, AT, and compatibles, as well as with all PS/2 models, the company said.

The Data Directors feature a printed circuit board and gold-plated connectors

to assure that data will be switched and transmitted without degradation, the company said. A heavy metal enclosure and connector termination provide increased durability and shielding from interference.

The Model 2020 is a stand-alone unit. The Model 2000 can be installed into the empty pocket of Computer Accessories Expandable Power Director Models P15 and P3, which are surge protectors that fit between a CPU and monitor. The surge protectors sell for \$149.95 and \$139.95, respectively, according to the company.

Data Director Models Q200 and Q2000 are now available and sell for \$79.95 each, the company said.

Computer Accessories Corp., 6610 Nancy Ridge Drive, San Diego, CA 92121; (619) 457-5500.

Advanced Technologies Unveils Two Controller Boards for Laser Printers

By Bob Ponting

The DW-2 and DW-3 families of laser printers from Advanced Technologies International can now print collated copies of multipage documents with a controller enhancement called the Spooler/Collator, the company said recently.

With the new spooler board installed, ATI printers can print up to 99 copies of a 99-page document, according to Curt Burkett, ATI's chief executive officer. That amount of spooling requires an additional 512K of RAM, which is optional.

The printers, which can connect to either a local or a remote computer, buffer a single copy of the document in their internal memory, printing as many collated copies as needed, according to Burkett.

The Spooler/Collator comes in two models. The SP-1 comes with 512K of page memory and is priced at \$1,195. The SP-2 ships with a full megabyte of RAM and costs \$1,495.

Advanced Technologies International Inc., 355 Sinclair-Frontage Road, Milpitas, CA 95035; (408) 942-1260.



Genest Technologies' Keypatch II costs \$59.95 and comes with a DOS driver.

GTI to Show Latest Version of Keypatch Auxiliary Keyboard

By Bob Ponting

Genest Technologies Inc. (GTI) will show a new version of its existing Keypatch II auxiliary keyboard at fall Comdex in November, the company said last week.

The Keypatch II is designed to give a standard IBM keyboard the additional functions of the enhanced IBM keyboard, according to GTI.

The keypad will have the same set of 10 keys—four cursor arrows, page up, page down, home, end, insert, and delete—that is contained on the current Keypatch II, said Frank Ziegler, sales manager at GTI.

The only difference is that the current product is designed to fit horizontally above the main keyboard, and the new vertical model will fit vertically along the left or right side. Both models allow users to use cursor keys without resorting to the Numlock key.

Both models of the Keypatch connect to PC-compatible computers through the parallel printer port. The Keypatch uses a special pass-through connector, so the printer can continue to use the port without conflicting with the Keypatch keyboard, according to GTI. Attaching to the printer port lets the Keypatch work with any PC, including laptops, Ziegler said.

The \$59.95 keypad comes with a DOS driver that allows users to redefine any Keypatch key as a sequence of up to 15 characters.

Genest Technologies Inc., 3505 Cadillac Ave., Building K1, Costa Mesa, CA 92626; (714) 545-5040.



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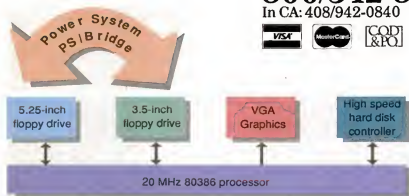
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News Briefs

Dove Ships Nubus I/O Boards for the Mac

Dove Computer Corp. announcing it has started shipping its Nubus input-output adapter boards for the Macintosh II. The boards permit the computer to access industry-standard serial and parallel peripherals.

The \$299 Nubus Parallel/Serial (NPS) board supports one Centronics-compatible parallel port and one serial RS-232C port.

The Nubus Multi-Comm (NMC) provides the same ports, as well as a serial RS-449 asynchronous/synchronous port and a serial RS-530 asynchronous/synchronous port, according to the company. The two latter ports are newer serial standards that permit more connection points and a longer length than the older RS232C port, said Jim Nealon, Dove Computer's product manager. The ports provide the capability to use intelligent terminals on the line, he said.

The Nubus Multi-Comm board comes with 64K of ROM that automatically configures the board and Macintosh operating system on boot-up. The Multi-Comm board sells for \$449.

Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405; (919) 763-7918.

National Instruments Enhances Labview Tool

National Instruments recently introduced a major enhancement to Labview, its general-purpose tool that integrates data acquisition, analysis, and instrument control.

Among the new features in Labview 2.0 are enhanced editing and graphics capabilities to increase its flexibility in handling programs, reduced execution time, and support for color.

The Labview graphical interface allows easy manipulation of front panels and block diagrams used for software development, according to the company. User editing of front-panel knobs, dials, switches, meters, and graphs automatically builds measurement programs and replaces writing lines of code, according to the company.

The new version will be available in late September. It will cost \$1,995.

National Instruments, 12109 Technology Blvd., Austin, TX 78727; (512) 250-9119.



Dukane's Magniview 342 display panel uses "chip on glass" technology to prevent damage during transportation.

Dukane Announces LCD Display Panel for Mac

By Nick Arnett

Dukane Corp. announced recently an LCD projection display panel for the Macintosh that works with any transmissive overhead projector.

The Magniview 342 projects a screen image in blue over a light-blue background. It has screen resolution of 512 by 342 pixels.

Dukane's display panel for the Mac uses "chip on glass" technology to prevent damage during transportation. Controls include contrast, display color reverse, vertical positioning, and

synchronization with the computer signal.

The unit's glass panel can be written on directly with a water-soluble pen without damage, the company reported.

The suggested retail price of the Magniview 342 is \$1,395, and it is shipping now, according to the company. The display panel has a one-year warranty. A protective carrying case is optional.

Dukane Corp., 2900 Dukane Drive, St. Charles, IL 60174; (312) 584-2300.

Automatic Hypertext Linking Added to Sonar

By Scott Mace

Virginia Systems has released Sonar Professional, a text-retrieval program the company says is the first to use automatic hypertext-based linking capabilities.

Like the original version, Sonar Professional searches free-form text in multiple files without requiring the user to set up a database, the company said. The program is intended for users who need to quickly search and index large volumes of material, the company said.

The new automatic hypertext feature allows the user to interrupt a search at any point to add a note or perform other searches, said Virginia Systems president Philip Van Cleave.

Currently, users of hypertext programs such as Hypercard and Guide have to create links between related information manually, making these programs impractical for handling large amounts of information, Van Cleave said.

Sonar Professional allows us-

ers to search through an infinite number of levels, limited only by available memory and disk space, according to Van Cleave. The program marks related words or phrases and records exploration paths for future analysis.

Searching has been sped up by more than 15 times in the new version, to over 4,000 pages per second on a Macintosh II, Van Cleave said.

Word order in a search can now be specified in the new version, and a link file can be used to predefine standard searches and phrases. The program also now supports additional file formats, including Microsoft Word, Mac Write, View Now, and MS-DOS text files.

Sonar Professional is available for \$795. The company will continue to sell the original Sonar program for \$295.

Virginia Systems, 5509 W. Bay Court, Midlothian, VA 23112; (804) 739-3200.

• TECHNOLOGY UPDATE

Connectivity Seen to Boost Mac Databases Tools to Spur Applications

By Nick Arnett

The slow-moving Mac relational database market may pick up steam as software becomes available to link Macs to minicomputers and mainframes, say third-party database developers.

Users and the database publishers depend on the third-party developers to create specialized database applications. According to Infocorp., a market research firm in Santa Clara, California, Mac users haven't taken to powerful databases nearly as quickly as DOS users.

"The biggest thing I see making a difference in the next year is connectivity to larger computers," said Richard Wolpert, president of After Hours Software, a database application developer in Encino, California. After Hours has developed a lead-tracking application for stockbrokers.

Software tools such as CL/I, the connectivity language in development by Apple subsidiary Network Innovations, will trigger increased application development, Wolpert said.

"CL/I is very important," said John Zoltai, president of Generation Four, a database application developer in Albuquerque, New Mexico. Zoltai has worked with Blyth Software Inc.'s Omnis and Acus Inc.'s 4th Dimension.

"The big problem is that micros are great for data entry, graphics, and so forth, but they never will be great for what mainframes are good for — storing and manipulating huge piles of data," Zoltai said. "You're never going to get there with a micro. But big computers are not good at handling data back out to users."

But CL/I, an extension of Structured Query Language — a standard database query language — isn't a commercial product yet, and some developers think the excitement about connectivity is premature.

"I would imagine that for people in big corporations, connectivity will be important," said Richard Ney, marketing manager at Fox Software Inc. of Perryburg, Ohio. Fox publishes Foxbase Plus, a Dbase clone for DOS computers and Foxbase Plus/Mac, that can use Dbase application code on the Mac. However, Ney added, "It's very early, hard to know how important connectivity will be. We have evaluated SQL packages, and we're not impressed with performance. Obviously Apple thinks it's important, given its acquisition of Network Innovations."

Mac business applications based on databases have also been slow in coming because Apple has only recently had success positioning the Mac as a general-purpose business computer, several developers said. "The Mac is now in the right place," Wolpert said.

Dac Enters Mac Market With Accounting Package

By Paula Stone

Dac Software will enter the Macintosh market next month with the introduction of Dac-Easy Light, a small-business accounting program.

The \$69.95 package uses the standard Macintosh interface and performs multilevel, double-entry accounting calculations and transactions automatically in the background, according to the company.

The program offers a full range of functionality, such as the capability to set up budgets, track expenses, and reconcile bank accounts, according to the company.

User data stored in the pro-

gram is used to prepare and print checks, invoices, accounts payable and receivable, and a number of financial statements. It displays and prints financial statements as a chart of accounts, a balance sheet, an income statement, or the actual, revenue/expenses, and variance budget reports.

The Macintosh version of Dac-Easy Light has a scan button to review records and supports an unlimited number of records.

Dac Software Inc., 17950 Preston Road, Suite 800, Dallas, TX 75252; (800) 997-7779, (214) 248-0205 in TX.

AI-Based Tools for the Mac Unveiled

By Stuart J. Johnston

ST. PAUL, MN — Vendors demonstrated last week several new AI-based tools for the Macintosh at the American Association for Artificial Intelligence Seventh National Conference.

In addition to the introduction of Mac Ivory by Symbolics

and Nextra by Neuron Data (see "AI Vendors Unveil Major Products," August 29), Graphical of Waltham, Massachusetts, released GREG (Graphical Representation of Entities for G-base). GREG shows graphically the network of relationships between G-base objects,

automatically displaying changes made to the database during a session, the company said.

GREG costs \$2,800 for the Mac II with the Texas Instruments Microexplorer board when purchased with the G-base Developer's Kit, according to

the company.

Current owners of G-base for the Mac II can upgrade for \$4,900. It is also available for Apollo, Sun, Symbolics, and TI workstations, according to the company.

Human Intellect Systems of San Mateo, California, announced it is shipping Instant-Expert Plus, a development tool for creating customized expert systems on Macintosh computers. The product, a greatly

enhanced version of the company's \$49.95 Instant-Expert package, features advanced graphics and more inference control. Instant-Expert Plus costs \$498.

Flavors Technology Inc. of Amherst, New Hampshire, announced it will ship in late 1988 the FT-60 Bus-Link for the Macintosh II and the FT-70 for VMEbus-based computers. The Bus-Link subsystems provide high-speed links between the buses of two computers, creating a memory-sharing environment that allows programs on one computer to directly access data on the other.

Both Bus-Link products, which will be priced depending on specific system configurations, will link machines based on the Nubus, VMEbus, Multibus I, Unibus, Qbus, Sibus, or Lbus architectures, the company said.

Letraset USA To Reinroduce Application

By Carole Patton

Letraset USA has changed the name of the color desktop presentation software it acquired from Manhattan Graphics Corp. from Ready-Set-Show to Standout and said it plans to develop the software itself.

"This will be our own product," said Lisa Wellman, spokeswoman for Letraset, which acquired worldwide marketing rights to Ready-Set-Show in July.

Wellman also said Letraset would offer the remaining stock of Ready-Set-Show for \$295, which is \$100 less than Standout's proposed retail price of \$395.

In addition, Letraset last week inked a deal with the Elmwood, New York-based MagiCorp service bureau to offer Standout customers overnight 35mm slide services. MagiCorp will accept Standout files transmitted by modem using a toll-free number, according to Wellman. Letraset will also provide communications software free to registered Standout users, she added.

Standout offers advanced charting and graphing features and has a built-in word processor. Standout creates thumbnails for viewing an entire presentation and master frames for repeating elements. Templates can be created containing font, size, style, color specifications, text, and graphics stored in a design library. Standout comes with a starter library of 50 templates.

Letraset already markets Ready-Set-Go, also developed by Manhattan Graphics.

Letraset USA, 40 Eisenhower Drive, Paramus, NY 07653; (201) 845-6100.



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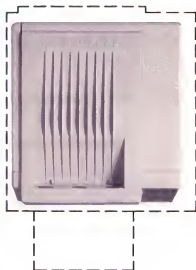
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News
BriefsSony Places Its Widget
Toolkit in Public Domain

In an effort to promote applications development for its new family of workstations, Sony has placed its Widget user interface toolkit in the public domain.

Widget allows applications developers to move their applications among any machines that support the X11.2 version of MIT's X Window system protocol, the company said.

The Widget toolkit includes buttons, pull-down menus, menus, windows, text, and dialog boxes. It was developed using object-oriented programming techniques, so its functionality can be expanded by changing the intrinsic of the objects. Sony has sent the software to the X Consortium for inclusion on the Consortium's X11 general release tape this fall.

MAD Introduces 20-MHz
386 Workstation Family

MAD Intelligent Systems introduced last week a new family of workstations based on the 20-MHz version of Intel's 386 processor. The system's main RAM is implemented with Unix System V.3, which is a relabeled version of Interactive Systems' 386/iX. The new system will support NFS as well as X Window, Release 11.2. "This was designed as a Unix box from the ground up," said principal engineer Robert Blackmer. Low-end, 1,280-by-1,024 monochrome versions with four shades of gray start at \$14,000 and are available now.

MAD Intelligent Systems, 2950 Zanker Road, San Jose, CA 95134; (408) 943-1711.

Driver Links Scanners
With Apollo Systems

Travel Corp. has created a software driver that links its TruScan TZ-3 scanner with Apollo Series 3000 and 4000 workstations. The addition of the scanner will give Apollo users high-quality image scanning, including resolution of 300 to 900 dpi and up to 256 levels of gray. Single sheets and larger documents up to 12 by 17 inches can be accommodated on the large open scan bed of the TZ-3. The software driver is priced at \$495.

Travel Corp., 8943 Chatsworth Ave., Chatsworth, CA 91311; (818) 407-1031.

Rooms, Lisp Products
Highlight AI Conference

By Stuart J. Johnston

ST. PAUL, MN — The demonstration of Xerox PARC's user interface, Rooms, on Sun workstations as well as a flurry of Common Lisp introductions and updates highlighted this year's American Association for Artificial Intelligence Seventh National Conference held here.

Newly formed PARC spin-off Enviro Corp. displayed Rooms running on the Sun-3 workstation and announced that the windowing management system will ship on September 30 for \$2,995.

The Mountain View, California, company also showed two other products that have been ported to the Sun-3 and Sun-4 machines.

Medley is an advanced development environment for Lisp that was formerly called the Xerox Artificial Intelligence Environment, and Loops is a set of object-oriented extensions for Medley. Loops is available now and costs \$7,000, and Medley will ship for the Sun-3 in October and will be priced at \$10,000.

SUN COMMON LISP 3.0. Sun Microsystems Inc., also of Mountain View, introduced Release 3.0 of Sun Common Lisp, which costs \$3,500. The update, which is available now for Sun-3 computers and will ship for Sun-4 machines in January, features transparent, dynamic reallocation of memory and a dual-function compiler that serves as both a development and production compiler.

Apollo Computer Inc. of Chelmsford, Massachusetts, announced it will ship Version 2.2

of its Domain/Common Lisp in September and Version 3.0 during the first quarter of 1989. Both will run under the company's Domain/OS distributed Unix operating system and cost \$3,500.

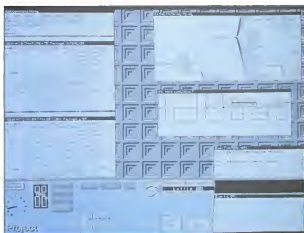
Franz Inc. of Berkeley, California, announced the availability of its Allegro CL Common Lisp for Apollo 3500 Workstations and Convergent Technologies Unix-based S-Series and Server PC computers.

NEURAL NETWORKS. Neuralware Inc. of Sewickley, Pennsylvania, is now shipping Neuralworks Professional II, a general-purpose neural network development package that costs \$2,995 for Sun-3 and Sun-4 workstations.

The package, which is designed to allow engineers and researchers to do rapid prototyping and concept testing, features 15 network paradigms and the capability for users to develop their own. A Macintosh version is slated to ship in the first quarter of 1989.

Gensym Corp. of Cambridge, Massachusetts, demonstrated the G2 Network, a communications architecture for the company's G2 Real-Time Expert System, which uses a TCP/IP Ethernet connection between computers from Sun, Hewlett-Packard, and Texas Instruments, and a DEC-Net connection between DEC Vaxstations.

The architecture allows developers to create a knowledge network consisting of distributed expert systems cooperating in real time.



With Rooms, a single room is dedicated to a project, with all the applications and files needed for that project.

Rooms Creates Desktop
Publishing 'Building'

Goes Beyond AI Applications

By Martin Marshall

Rooms, the second-generation graphical user interface from Xerox PARC, now sold by Enviro Corp., is likely to have usage beyond the AI and Lisp communities, according to Enviro president Roger McKee.

Essentially, Rooms creates a desktop building in which each room is a desktop metaphor, McKee said. In actual usage, each room is likely to be dedicated to a single project. A "door" icon allows the user to move "baggage" — either windows or files — from one room to another.

The same window can exist simultaneously in several rooms. Actions taken on a shared window of one room are reflected in the duplicate win-

dows residing elsewhere. Similarly, entire rooms can be included in other rooms, allowing different tasks to share the same collection of tools.

Users can also place any window in a "pocket" room, where it is accessible from any room in the system. The pocket room can be used, for example, to make a clock and personal calendar universally accessible.

Rooms can be grouped together to form "suites" representing larger tasks that can be saved and shared by other users. Developers can also add "buttons," screen icons that trigger customized program routines. Rooms comes preconfigured with eight standardized buttons, including doors.

Accounting Package for Xenix, DOS Driven by RDBMS

By Martin Marshall

A six-module accounting package, linked together by a Roladex module and driven by Unif's RDBMS database, has been released by Datamax Inc.

The Unique VI multiuser software packages are designed to run under Xenix versions on both Intel 286- and 386-based systems and Motorola 68020- and 68030-based systems. Another version of the same software is available for networked DOS machines.

The accounting software is designed to act as a front end to the Unif RDBMS, which is capable of creating files in either DOS or Unix environments and of converting data files between the environments.

Unique VI has modules for purchase orders, inventory control, sales orders, accounts payable, general ledger, and ac-

counts receivable, tied together through a Roladex module.

A feature called RangeSort-Inquire allows the user to select different ranges of Roladex records and then sort them according to user-selected field values.

PURCHASE ORDERS. The Purchase Orders module handles purchasing of both inventory and non-inventory items, and it has an adjustable print format to fit the purchase order form. It provides for on-line updating of inventory and updating of the purchasing history in the Vendor Details record, processes quantity discounts on a line-item basis, and provides status reports by vendor, purchase order number, or inventory item number.

INVENTORY CONTROL. The Inven-

tory Control module provides for "kit building" of finished goods from individually stocked inventory items. It tracks customer and vendor back orders and contains a manufacturing order system used to control all in-house assembly processes while receipts against manufacturing orders update the quantity on hand in the completed-goods inventory record.

SALES ORDERS. The Sales Orders module allows a different markup percentage to be calculated and displayed on inventory records for each line-item purchased. It also has a picking list to assist warehouse personnel in assembling materials listed on the invoice.

ACCOUNTS PAYABLE. The Accounts Payable module contains

a Vendor Roladex, Vendor Details, and the capability to age an individual account as of any date, rather than just the date at the end of the period.

Although it is aimed at small and medium-size businesses, Unique VI has some features that will appeal to large companies, such as the General Ledger capacity to handle 9,999 companies, each with its own chart of accounts, and up to \$99 billion in year-to-date totals.

The list price on the full six-module package, including the Roladex module, is \$5,500 for the multiuser version, with one-year support options ranging from \$500 to \$1,100. An MS-DOS single-user version is available for \$650.

Datamax Inc., 3055 Paseo Tranquillo, Santa Barbara, CA 93105; (805) 682-3442.

News Briefs

Company to Develop Mac Storage Products

Storage Dimensions, a subsidiary of Maxtor Corp., has formed a Macintosh business unit to develop high-capacity high-performance storage products for the Mac, the company announced.

The San Jose, California, company, which supplies high-performance drives for IBM PCs and compatibles, intends to introduce its Mac products in early November, said Greg Brashier, Macintosh product marketing manager.

Mac hard disks will range from 50 megabytes to 1.2 gigabytes, with internal and external configurations for the Mac SE and Mac II computers. Storage Dimensions also plans to introduce its Mac optical discs and other backup systems, according to Brashier.

Storage Dimensions is also working on ways to increase Mac disk drive performance, including overcoming the SCSI port speed bottleneck.

Planting Viruses Could Become Federal Crime

In response to reports of computers being infected by viruses, Rep. Wally Herger of California has introduced legislation that would make planting computer viruses a federal crime.

The bill, H.R. 5061, would impose a maximum 10-year sentence for anyone convicted of "knowingly or having reason to believe that [entering] such information or commands will cause loss to users of a computer on which such a program is run."

The bill would also allow virus victims to sue for civil damages, including court costs.

The bill does not address enforcement, although it would be within the jurisdiction of the Federal Bureau of Investigation's Computer Security Division, said Doug Riess, a spokesman for Herger.

However, some say the proposed law is too broad and duplicates existing law. Current statutes making unauthorized access illegal already supply a legal deterrent to would-be virus planters, said Ronald Palensky, general counsel for the software association Adapsa.

Also, because the bill requires that viruses cause loss, it ignores simple message viruses, Palensky said.

Computer Associates Acquires MRM Publisher

By Alice LaPlante

GARDEN CITY, NY — Computer Associates International Inc. announced last month that it had acquired Atrium Information Group Inc., developer of Micro Resource Manager software for managing PC resources within a corporation.

Brett Bullington, vice president of sales and marketing at Computer Associates, said the company acquired Micro Resource Manager (MRM) because it was a "good match."

"Look at what we already do,

and you'll see we've already started selling to the microcomputer manager," said Bullington. "We have mainframe software we sell to the MIS director and organization as well as an increasing number of PC software packages."

Computer Associates will market the MRM family in a number of different ways. As CA-Netman/MRM, the product will complement Computer Associates' current Netman offering, which helps MIS direc-

tors control and manage data processing resources, the company said.

"While Netman provides a comprehensive solution to centralized data center administration, Netman/MRM offers a logical extension of those capabilities to the distributed micro-based resources often associated with end-user computing," said Bryan Shepherd, president of Computer Associates' Systems Products Division.

The offices of Atrium will remain in Fairfield, Iowa, and Atrium will continue developing, supporting, and marketing the MRM product line. Standard customer support policies will remain in effect, and support calls will be handled by MRM's staff in Iowa, according to Kenneth Ross, president of Atrium Information Group Inc. Netman/MRM is also avail-

able as a component of Computer Associates' data center administration software solution, Unipack/DCA.

In addition, MRM will be sold through Computer Associates' Micro Products Division in two configurations.

MRM Professional, the high-end version of the product, retails for \$4,995 and contains a full range of features, including inventory and configuration management, warranty and maintenance tracking, and purchasing and receiving management.

MRM 300, the \$1,995 mid-range version, provides most of the features found in MRM Professional but is limited to supporting 300 PCs and 3,000 components.

A low-end version will ship in October, according to the company.

Unisys to Supply 9 000 PCs to U.S. Coast Guard

By Scott Mace

Unisys Federal Information Systems of McLean, Virginia, has been awarded an \$82 million contract to supply up to 9,000 286-based and 386-based PCs to the United States Coast Guard, the company said last week.

The Unisys proposal featured its BTOS personal computers, which will run MS-DOS, AT&T Unix System V Interface Definition (SVID), or BTOS II, which is a multitasker, multitasking operating system. BTOS is compatible with the Convergent Technologies CTOS operating system.

The contract also calls for Unisys to maintain, support, and upgrade the Coast Guard's installed base of 7,500 workstations, including 6,000 Convergex systems and 1,500 PCs

from other suppliers. The contract runs four years, with four one-year options.

The Coast Guard will use the Unisys systems for mission-critical applications such as search and rescue, shipboard maintenance, and law enforcement. The B 28 contains an 8-MHz 286, and the B 38 contains a 16-MHz 386. Both workstations, which will be available on an as-needed basis, will assist the Coast Guard in achieving a paperless environment and a Coast Guard communications network, according to Unisys.

Locally, the Unisys PCs will be connected to each other and other PCs via local-area networks, which will provide distributed processing, according to a Unisys spokeswoman.

Trade Groups Endorse Bill To Outlaw Software Rental

By Rachel Parker

Software trade groups are rallying around a proposed bill that would prohibit companies from renting software to potential buyers without specific consent from the developer or publisher.

The Computer Software Rental Amendment of 1988 — an amendment to the U.S. copyright law — would require software rental companies to get copyright holders' approval before renting applications. The proposal is supported by both the Software Publishers Association and Adapsa. Representatives for both groups testified last month at Provo, Utah, subcommittee hearings on the bill.

"Our first concern with software rental is that not a lot of people are renting software to execute part of a task," said Chris Carleton, a spokesman for Adapsa. "Our concern is that people rent it, dupe it, and return it. If you need Lotus, you need it on an on-going basis."

In addition to essentially promoting software piracy, software rental firms, which typically offer popular applications for as little as \$10 or \$20, can seriously threaten the success of small companies, said SPA president Heidi Roizen, who is also president of T/Maker Co.

"If a software company develops a product that fulfills a new need and captures the public's interest, that company's growth can be squashed if unauthorized commercial parties are able to exploit and, if you will, steal the capability to reap the benefits from that product," Roizen said.

Speaking on behalf of Adapsa,

so, Thomas Chan, deputy counsel for Ashton-Tate, was more direct.

"The loopholes in the U.S. copyright law have encouraged pirates to restructure themselves as software rental outfits," Chan said. Chan, who has been aggressive in challenging software piracy abroad, said rental companies not only deny publishers of sales revenues but also encourage pirates in Asia and Europe to set up their own rental organizations.

"The rental pirates will no doubt encourage other pirates in countries like Korea and Italy to follow suit and wipe out the legitimate software market in those countries," Chan said.

Already, Carleton said, in Canada software pirates operate freely under the guise of software rental operations. Adapsa wants the U.S. government to restrict the spread of software rental companies before they become a similar problem in the United States. "There is a feeling that if software rental is let go with no monitor, we will have the same problem we had with software piracy, and it will get worse," Carleton said.

Both Roizen and Chan said software rental companies are growing more numerous and bolder, with some even advertising in computer journals.

The bill, proposed by Sen. Orrin Hatch of Utah, will go to a full committee hearing later this year. However, given the few number of days remaining in this session of Congress, it is unlikely that the bill will be passed this year.

Dbase III Plus Still Leads Egghead Database Group

	TOP 10 DOS DATABASES	TOP 10 DOS GRAPHICS
1	Dbase III Plus 1.1 , Ashton-Tate	Harvard Graphics , Software Publishing
2	Paradox , Borland	Freelance Plus , Lotus
3	Rbase for DOS 2.1 , Microm	GEM/3 Draw Plus 2.0 , DEI
4	Q&A 3.0 , Symantec	Graphwriter II , Lotus
5	Reflex , Borland	Chartmaster Premium Pack 6.2.1 , Ashton-Tate
6	PFS Professional File , Software Publishing	Picture Perfect 4.0 , Computer Support Corp.
7	Dataspace, Release 3, Version 2.5 , Dataspace	Diagram Version 4.0 , Computer Support Corp.
8	Rbase System V 1.1 , Microm	Time Line Graphics, Version 1.1 , Symantec
9	VP Expert , Paperback Software	GEM/3 Presentation Team 1.1 , DEI
10	Rapidfile 1.2 , Ashton-Tate	Microsoft Chart 3.0 , Microsoft

SOURCE: EGGHEAD DISCOUNT SOFTWARE, BASED ON GROSS CORPORATE SALES DURING JULY 22 AND AUGUST 22.

With a major update just weeks away, Dbase III Plus led relational database sales, while Harvard Graphics maintained its graphics lead.

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In fact, The Advanced Edition of the Norton Utilities includes every single one of the features, functions and enhancements that have made Version 4.0 so popular.

Right down to the user interface which, according to the *InfoWorld* Review Board makes the Advanced Edition "as easy to use as possible."

And that's not all.

The more the merrier. Because the Advanced Edition goes on to include a wish list

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Like *Speed Disk*, for tightening up disk space and optimizing access.

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All of which explains why *InfoWorld* called the Advanced Edition "a great program that has gotten even better."

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Tech Street

By John Gantz

Demand for Full-Page Displays Will Surge as Users Outgrow Small Screens

When gold was discovered in California in 1848, not all the money made in the ensuing gold rush was by mining companies and lucky prospectors. Saloon keepers, merchants, blacksmiths, assayers, and brothel owners also made out. In fact, often more substantially than the prospectors.

Watching the great corporate stampede to desktop (or is it work group?) publishing has got me thinking about these things. Publishers, seminar givers, scanner manufacturers, cable and accessory suppliers, and maintenance firms are all feeding at the trough.

One of the more quietly successful groups following in the wake of burgeoning desktop publishing sales, at least according to a new report published by *Micropublishing Report* of Torrance, California, is the cadre of full-page display vendors. The incredibly detailed report is written by James Cavuto, David Pope, and Ajit Kapur and is available for \$1,595 (call [213] 371-5787).

Although the report looks overly optimistic at first blush in its prediction that the full-page display market associated with desktop publishing will jump from revenues of \$43 million last year to \$148 million this year and on to \$995 million in 1991, upon reflection I think Cavuto and crowd may be underestimating the potential demand for these tools. More on that later.

You understand, of course, what these full-page displays offer. They take the partial page presentations available on the Mac or PC and blow them up to full size, they cut glare and flicker and often enhance resolution, and in the Cadillac versions they provide true WYSIWYG images. The latter eliminates spacing and proportion problems that can occur on images close to the edge of those curved conventional screens. High-end units can also provide gray-scale shading unavailable on smaller screens.

To date, there have been only three major drawbacks to using these full-page displays:

- Cost. We're talking roughly \$2,000 per display, counting cables and service.
- Footprint. The units generally have 15- or 17-inch diagonal displays that dwarf the diminutive Apple monitor and hog a significant amount of desk space.
- Software. Since most desktop publishing software was designed with smaller screens in mind, there are optimization problems. Plenty of popular software isn't built to take advantage of the full-page display technology. Cavuto points out, for instance, that for high-resolution displays to work well with the Mac, they must limit themselves to the 72-dot-per-inch resolution intrinsic to the Mac.

But these, I propose, are not insurmountable odds. Here's why:

First, desktop and work group publishing is evolving from a "nice to have" application to a "need to have" one. Users acquiring it have watched it grow from a curiosity to a technology that's tightly woven into daily business practice. The question is not whether to use desktop publishing but how to improve it. With casual users becoming full-time operators, there are significant productivity and ergonomic arguments to be made for full-page displays.

Second, costs will drop. But more importantly, the value of desktop publishing is increasing to the point where the expense of adding bigger displays doesn't loom so large.

Third, the display makers and the software vendors are working to match software drivers to full-page display capability. Pagemaker and Ventura look a lot more impressive on a big screen. And adding gray-scale and color capabilities are logical extensions to standard desktop publishing packages.

Fourth, I want one.

This last point is not trivial. I am a recent convert to desktop publishing and a Luddite at heart — but even I can see the utility of a full-page display. For those of us who have been word processing for the last 10 years, WYSIWYG has an almost erotic allure.

And this brings me to my final point: status. Small has gotten about as beautiful as it can — with laptop computers and small-footprint desktop computers the order of the day. Now it's time for BIG to have its turn. The big screens look so, well, professional. Serious. Untoylike. Sit one next to the Mac and run the two in tandem, and there's no question which one you'd want to work on. There's a creative aspect here that I've yet to see anyone address. Like the mystery of subsecond response time — which has been shown to make computer operators disproportionately more productive — these things may actually make us better artists, wordsmiths, and page composers.

Anyway, that's my theory. Even without this last intangible, I can see demand for full-page displays growing at least as strongly as the *Micropublishing* study indicates. Crossover technology and markets with CAD displays will only help.

John Gantz is editor of the *Tech Street Journal*, a newsletter on the high-tech stock market and business performance. The views expressed are his own.

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Tech Talk

By Steve Gibson

Choosing a Display Subsystem for Your PC Isn't as Easy as It Used to Be

I remember those days not so long ago when a purchaser of a new IBM Personal Computer had only one simple decision to make when it came to choosing the display system for his computer. Blessedly, the only choice to be made back then was having either a monochrome display and adapter, the so-called MDA solution, or a color screen and adapter, the CGA route. Needless to say, things are not so simple or straightforward these days. There are so many choices and options open to a purchaser or upgrader of a PC that I'd be crazy to even attempt to offer any clarification or guidance on which to choose.

OK, so call me crazy. It's time to choose the display subsystem for Steve's Dream Machine, and I've got some real surprises in store for you this time. I've spent most of the past six weeks (when I haven't been reconfiguring my system between VM/386, Desview, and Omniview) researching, probing, and digging for the best possible contemporary display solution for the least possible money.

Surprisingly, my research has uncovered some truly startling facts that I'll be sharing through the next few weeks as we explore *The Display System for Steve's Dream Machine*. We'll see things like why the new 16-bit display adapters are

generally not worth a dime more than their older 8-bit predecessors and how few, if any, VGA adapters on the market are really register-level compatible and what risk this represents in light of IBM's unknowable future plans. We'll see what extra display money doesn't buy for you because many of the manufacturer's device drivers don't even use it, why the highest resolution modes can be much more trouble than they're worth, and what not to pay for a great high-resolution display.

Given the incredible variety of available choices (not at all like in the old days), it may surprise you to know that I have found one set of choices that delivers far more bang for the buck than any other. In order to give these conclusions a proper perspective, let's first step back for a moment to review the technological fundamentals and constraints that give our decision meaning. Then we'll see where we've been and where we're going.

No matter what style of display screen and interface adapter is in use, several fundamentals always apply. In the first place, the image displayed by a CRT screen is not at all the static image that it appears to be. In actuality, there's never really an image being displayed on the screen at all. If you were to photograph a

computer display screen with a high-speed camera, you'd see only a single bright dot of light rather than an entire image.

The illusion of a screen full of information is created with the aid of some incredible technology. The screen is actually painted by a single madly whizzing dot of light that traces successive horizontal lines across and down the face of the display tube. When I say "madly whizzing," I am not exaggerating.

A typical CRT screen paints horizontal scan lines on its face at the rate of 350,000 inches per second, which is 20,000 miles per hour! This furious speed is required in order to fool our eyes into believing that the entire image is being continuously displayed when, in fact, it's mostly not being displayed.

A typical display screen consists of about 450 of these horizontally scanned lines, each of which must be redrawn or "refreshed" at least every sixtieth of a second. This means scanning across 27,000 lines per second, every second. If this is not done, our eye will perceive that the lines are not being continuously illuminated, and the illusion that we have tried so hard to achieve will then fail.

As the single dot of light traces its

furious course, it changes color, thus tracing out the full-screen image that is stored in the display adapter's "display refresh memory." On a monochrome screen that is limited to displaying a single color, the dot of light varies in brightness only, whereas a color display system allows the dot's instantaneous color to be varied as well.

So we're left with a number of important concepts. In order to eliminate the overall "refresh flicker" of a display screen, the entire screen must be redrawn or repainted approximately 60 times each second. Since the scanning dot traces lines from left to right and moves more slowly vertically from the top of the screen to the bottom, the downward motion is referred to as the screen's vertical refresh frequency, and the very rapid horizontal left to right scanning is referred to as the display's horizontal refresh rate.

Next week we will apply these concepts to understand the importance of the fixed, multiple, and multifrequency display screen standards that exist today.

Steve Gibson is the developer and publisher of Spin Rite and president of Gibson Research Corp. of Irvine, California. The views expressed are his own.

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AD CODE NO 116177



The Corporate View

By Alex Kask

Reasonable Assumptions About Standards Often Lead to Nasty Surprises

Some people call it paranoia. Some call it dead horse. But I can't seem to get off the topic of standards. Every time I get bored with writing or talking about it, and every time I get the feeling something is being done about it, something happens to set me off again.

This time it was a couple of things that happened on the same day.

First, my printer ribbon finally gave up on me. Because I have a laser in my office, I don't use my dot-matrix printer for much other than envelopes or gigantic spreadsheets. Therefore, I don't keep a stock of spare ribbons handy for quick swaps.

Easy solution: Go to the supply room to get a ribbon. First snag: The supply room closes at 5:30 p.m. So that means I wait until morning to print out the envelopes.

Second snag: Requisition the standard ribbon for our standard size, popular-brand, dot-matrix printer and try to install it in my printer. And I discover that although the brand name and the paper size are the same, the case and the innards look pretty much the same, and the ribbon cartridge looks the same, it doesn't fit.

You see, I had decided that I needed a near-letter-quality printer. And I had figured that the manufacturer we had

decided to standardize on would use the same printer ribbon cartridges for all of its printer models of one size. In fact, that seemed so logical I didn't even question the matter. I simply ordered that maker's letter-quality model.

Well, you know what they say about the word *assume*: It makes an ass out of U and ME. Now I find I have to find storage space for a dozen ribbons in my office.

The second thing that happened was potentially more serious. The dread hard disk failure finally caught up to me. Actually, the disk didn't fail; I simply ran out of room. I forget whose law it is, but no matter what the size of your hard disk is, you have only 1 megabyte of free space on it. Now that was indeed common when 10 megabytes was standard, and in our shop it is common when we have 15 megabytes of software to put onto 25 megabyte disks, but you don't really expect it when you have 300 megabytes of space to start with.

Actually, I didn't completely run out, but when I bought my system I assumed (again!) that partitioning it as 100 megabytes and 200 megabytes would give me enough room on the C: drive for all my programs and leave reasonable space on D: for data files. And this was true for a long time: The standard software my

firm uses takes only 15 megabytes, and my personal additions and modification to that list add another 15 megabytes.

Eventually I found myself with a beta copy of a new spreadsheet version and no place to put it. And I didn't want to wipe out anything else, such as a rarely used piece of graphics software, because as soon as I did, someone would come in with a problem only that package could solve.

Well, that's easy to fix. If 100 megabytes isn't enough, 150 should do the trick. And my backup system will help me make the transition. So get a new backup (on 135-megabyte tape) of both C: and D: and reformat the disks. And do a low-level reformat on them. And discover that the backup tapes will restore only to the same disk structure from which they were created (meaning the same number of sectors).

Now of course, as soon as I found myself without a computer, three emergency problems came in that had to be solved. So we let's put the thing back the way it was and leave the reformatting for a later day. Famous last words.

When you format your disk as a 100/200 split, how many sectors do you put in each partition? (Easy: divide the total number by three.) Next question: How

did your computer dealer decide to split 314 megabytes? Is it 100/214, 105/209, 114/200? Or something else? (Also easy: something else. Never the obvious.) So you keep trying reformat with 100/214, try to restore, get the "incompatible disk and tape" message; reformat with 101/213, try to restore, etc.

No time to waste? Who was it who said that?

Incidentally, some people have commented to me that my quest for standards is excessive and will lead to a regimented society. My answer to them is that if you want me to maintain your fleet of cars, I will indeed recommend standard vehicles, based on your needs and desires. If you hire me to administer your computing equipment, I will support any equipment that will meet your needs. You want Macs, I'll give you Macs. But don't come to me with a list of 100 different configurations for 200 people and expect support for all of them. For that you don't need a micro-computer manager—you need a good dealer. And deep pockets.

Alex Kask, a CPA, is a Senior Manager in Ernst & Whinney's Computer Audit Department and is president of the Microcomputer Managers Association. The views expressed are his own.

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—	C/T 101	\$99.00	\$
—	C/T 84	\$79.00	\$
—	PS/2 Model (Add for sell)	\$25.00	\$

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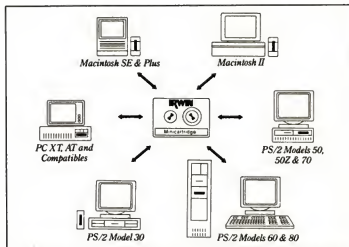


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To the Editor

SABRE RATTLING

The article, "Users Criticize Limited Capabilities of First Extended Edition Release" (August 1), carried comments from Walter Beaulieu of American Airlines' Sabre division that were negative toward the product.

First and foremost, Beaulieu's comments do not reflect the views of Sabre's senior management regarding OS/2. Several groups within the company have been working with pre-release copies of Extended Edition and others with developers' toolkits. Our collective experience with the robust possibilities OS/2 offers leads us to be optimistic about the operating system's future market potential.

We always try to keep open all avenues through which we might increase our technological advantage in the marketplace, and the Extended Edition may eventually help us accomplish just that.

Second, Beaulieu does PC maintenance on hardware, not evaluation of new products, so he was not the source your writers should have approached in the first place.

Third, the corporate communications department supporting Sabre would have been more than happy to arrange an interview with Terry Jones, Sabre's vice president for product development, to discuss OS/2 or any other product we might be evaluating or developing ourselves.

If you try asking our editorial staff, I'm sure you will learn that American Airlines is very responsive to requests for media interviews of senior management — from Max Hopper on down.

John Holard

Manager

Corporate Communications

Information Systems

American Airlines

Dallas/Fort Worth Airport, TX

THE MAGIC SAC

George Morrow's Technology Show

column of July 4, discussing emulations, showed that he had not kept up on the events about which he was writing.

He said, "The most sensible way to clone the Mac is through emulation, and if it's possible, Apple wants to do it first."

It seems obvious that he is unaware of a Mac clone generated by emulation that has been around for about two years.

The Magic Sac, created by David Small and distributed by Data Pacific, runs on the Atari ST and literally turns the ST into a Mac.

Approximately 90 percent of all Mac software runs flawlessly on this "Mac clone," including Pagemaker 2.0a, Excel, Microsoft Word, and most other packages.

It not only runs flawlessly, but it runs faster (approximately 23 percent) and on a larger screen (12 inches) at less than half the price of a real Macintosh.

I have several friends who have purchased the Atari ST strictly as a Mac clone and are very happy with their purchase.

With the "Translator One," a device that sells for about \$250, they can even directly read and write to Mac disks on the ST's PC-type 3½-inch floppy drives. Yes, Virginia, there really is a Macintosh clone.

Bruce Horsford

Ketnering, OH

The Magic Sac requires the Atari ST user to install Macintosh ROMs, which are illegal to copy and difficult to obtain legitimately, since Apple doesn't sell them. Apple continually reaffirms its intention to protect its ROM and to prevent the cloning of the Mac.

—The Editors

LICENSING INFORMATION

In reading through a recent InfoWorld review of database products, I found myself wishing for one additional

piece of information.

As the MIS manager for Calmark Hospitality Systems, I am currently involved in developing certain PC-based applications to be installed at properties operated by our company.

The key to my needs is that these are specialty applications which are being developed in-house. Therefore, I need development tools that will allow me to mass-produce my programs and distribute them to all properties without having to go to the trouble and expense of putting runtime modules or full copies of the development products on the PC installed at each property.

A large number of copies of Dbase, for instance, runs to a very significant cost!

While products that are not copy-protected are desirable to be able to create working copies and archival backups, unless the product license specifically allows me to make copies and install the product on 100 to 200 systems, I am unable to use the product.

To date I have been unable to find any development product more sophisticated than Cobol or Fortran compilers that will allow me to achieve my goals without having to purchase copies for each current and future installation.

If your review had included information about possible licensing options that would meet the needs of organizations such as mine, it would have been much more useful.

David Ray Fuller

Manager, Information Systems

Calmark Hospitality Systems

San Diego

Please write to Letters, InfoWorld, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025 (MCI Mail 259-4127; Compuserve: 73267.1537; or The Source: TCS9391). Include your name, address, and daytime telephone number. Letters selected for publication will be edited for length and clarity.

Resources

September 14, Pleasantville, NY: The New York Metro Network Users Group will feature speakers from Novell, Brightwork Development, LAN Systems, Cybertek LAN Software, and Netline discussing LAN printing utilities. Contact: Steve Bachman, (516) 385-9008. Location: Reader's Digest Building, Pegasus Room A-B-C. Call for fees.

September 14-17, Santa Clara, CA: The third annual Seybold Desktop Publishing Conference Seminar and Exposition covers more than two dozen publishing topics with 80 speakers and features over 150 vendors. Contact: Seybold Seminars, (213) 457-5850. Location: Santa Clara Convention Center. Fee: \$795; \$25 for Expo only.

September 18, New York: The Information Center Managers Association of New York will present Arun Gupta,

co-founder and CEO of Dataease International Inc., at its monthly meeting. Future directions will be discussed, followed by questions and answers. A Dataease product line demonstration will be included. Meeting begins at 9 a.m. Contact: Joseph Sasso, (201) 284-5174. Location: Irving Trust, 101 Barclay St. Fee: free to members (\$100 per year information center).

September 27-29, Dallas: Network '88 attempts to address the marketing, purchasing, and educational needs of the connectivity market. The topics to be covered include planning, user views, mass storage, groupware, cabling, standards, training, security, and networking alternatives. Contact: Annie Zidnak, (201) 569-6406. Location: Dallas Infomart. Fee: \$40 to \$150.

September 29-30, San Francisco: October

3-4, Washington: Desktop publishing is the focus of this American Management Association seminar. Meetings will cover basic concepts in typography and design, selecting hardware and software for desktop publishing, packaged systems, and implementation. Contact: AMA Registrar, 135 W. 50th St., New York, NY 10020; (515) 891-0065. Location: in San Francisco, Miyako Hotel; in Washington, AMA Management Center. Fee: AMA members, \$695; non-members, \$795.

InfoWorld welcomes notices of national conferences, trade shows, and meeting schedules of professional data processing, MIS, information center, and microcomputer management associations or support groups. Send notices to Resources, InfoWorld, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025. No local training or education seminars, please.

A User's View

By Jerry Pournelle

Taking a Hard Look at Legal Assistance Software and Miscellaneous 'Stuff'

Every day we get a new pile of stuff at Chaos Manor. Some of it is instantly useful. Some is instant trash. Most of it, alas, looks to be useful, but not to me, or at least not just yet. Since I hate to throw away anything potentially useful, much of the stuff just accumulates until I think of something to do with it.

I've just brought an enormous pile over to the desk. It's short shift time at Chaos Manor.

One item I've long neglected is the Oren SPI Scientific Print Processor. This is a box that's part print buffer — there's a bit more than 40K of memory in it — but mostly it contains a whole bunch of symbols, codes, and character sets, so it can cause your FX-85 printer not merely to do near letter-quality output, but print Greek, Hebrew, math — such as integral and summation signs — sub- and superscript notes, small and large fonts, and other stuff.

BE IT EVER SO HUMBLE. In these days of laser printers, we tend to forget the humble dot-matrix; but in fact, an Epson FX-85 is still good enough for many jobs, especially if it's backed up by something like the Oren SPP. (SPI Electronics of Israel, U.S. distributor: Etron Computers, 895 Commonwealth Ave., Newton, MA 02159.)

While we're on the subject of dot-matrix printers and stuff that's "good enough," there's still Fontasy. (Prosoft, 7248 Belaire Ave., Suite 560, North Hollywood, CA 91603.) Fontasy is the poor man's desktop publishing package. It consists of a bunch of CCA-quality clip art that can be glued into other print composition files. Fontasy can also be used to generate mixed text and graphics for bulletin boards, invitations, announcements, and the like. It's not slick and sophisticated, and you sure wouldn't do a major company's annual report with it. I have both. And an Epson printer. On the other hand, it's quick and easy to use, and often it's more than enough to get the job done. Besides, it's cheap.

If you want fancy printing and you're willing to pay, there's a new version of Aldus' Pagemaker for either the Macintosh or your Windows-compatible PC. I have both. Until recently we didn't use either one of them, but now we've got some experience. What happened was that my son Alex wanted to make some fliers. Neither of us had ever used Pagemaker — most of my output goes out electronically nowadays, so I don't do fancy formatted printing — so this looked like a good chance to see what this desktop publishing craze is all about.

It took us about two hours to

learn the basics. Even on the Mac II some of this stuff is tricky. Then, once we got the hang of it, we were able to create fancy fliers, with different fonts, shaded and shadowed text, ornamental designs, and a whole raft of other stuff. It's hard not to go overboard when you see just what all you can do.

If you've been afraid of desktop publishing — I don't think I was, but I admit I didn't do much of it before — don't be. It will take a few hours of putting around, but after that the only limit is your imagination and

WHERE THERE'S A WILL. For example, there's Nolo Press/Legisoft Willmaker 3.0. (Nolo Press, 950 Parker St., Berkeley, CA 94710.) This is a computer program that asks you a bunch of questions, then creates a will based on the answers. It comes with a thick book that introduces you to the problems of estate planning.

Having said that, what else can I say? The program certainly works, in the sense that it creates a document that presents all your instructions in what appears to be legal language. It inserts odd provisions, such as

think the program looks pretty good?

I'll go this far. It can't hurt to look at this program, and I suppose that you've got to be better off with a Willmaker will than you would with no will at all.

BANKRUPTCY. Another legal program that came in recently is Bankruptcy 2. (Specialty Software Corp., Box 7026, Huntington Woods, MI 48070; [313] 398-9930.) Unlike Willmaker, this program is intended for lawyers. Its author says it "takes the tedious job of creating a bankruptcy petition down from as long as 8 hours to as little as 30 minutes."

It's menu-driven and designed to be used by secretaries under the supervision of lawyers. There are packages for Chapter 7, 11, and 12 bankruptcies. There's a large manual that explains what the program is doing, but it doesn't make many concessions to the layman when it comes to legal language.

Having said all that, there's not much else to say. I'd imagine this program could save a lot of time, which, one hopes, would mean fewer fees billed to clients, but I can't guarantee any of that. All I really know is that it exists, it runs, and it asks an inordinate number of questions.

COMPARERITE, ET AL. Legal soft-

In these days of laser printers, we tend to forget the humble dot-matrix; but in fact, an Epson FX-85 is still good enough for many jobs, especially if it's backed up by the Oren SPP.

aesthetic sense.

Incidentally, given that you have a fast machine with good EGA, the PC version with its Windows run-time package isn't any harder to learn than the Macintosh version. If you connect your PC to a really fancy printer — we used the Kyocera F-3010, which is loaded with fonts and has a bunch of fancy features — the output won't be any less fancy than what the Mac with its Laserwriter can do. The Kyocera is faster too.

IS IT LEGAL? Shakespeare's revolutionaries in Henry VI wanted to create confusion. One suggested a way to do it: "First thing we do, let's kill all the lawyers!" Nowadays that act might produce an entirely different result.

The problem is that everyone's scared. We all know that no one in this world is safe: You can be ruined by lawsuits, no matter what you have done and no matter who wins the case, provided only that your opponent has the financial resources to continue the suit. This means that the government can get anyone, guilty or innocent, if some prosecutor wants him bad enough.

In addition to being deplorable, this state of affairs creates a problem.

Lately I've been getting a lot of legal assistance software. The question is, what can reviewers say about that kind of thing? In particular, if I say I like some legal assistance program and it seems to give me legal advice, can I be sued? Can InfoWorld?

leaving each of your children \$1, this bequest being "in addition to and not instead of any other gift, bequest, or devise that this will makes to this person." It throws about phrases such as "powers," "authority," and "discretion" and other bombastic redundancies so beloved of lawyers. In a word, it makes a document that looks an awful lot like a will.

On the other hand, how in the world am I to know whether the document is worth anything? There apparently was a time when courts used to pay attention to plain language and clear intent, so the only real question in a probate case was whether the document was intended to be a will, and if so, was it the latest one? Now there are so many statutes and precedents stemming from sources as varied as tax laws and Civil Rights Acts that the intent of the will maker is just one factor among many for the judges to consider and the lawyers to haggle over.

Willmaker was generated under the supervision of Ralph Warner, a thoroughly qualified lawyer who has become well-known for his legal self-help books and general counter-culture attitudes. His publications rail against lawyers having a monopoly on legal work. He and his companion wrote and published the "Living Together Kit," a set of documents for couples who live together without the benefit of a marriage license. Certainly a fascinating chap, but none of that answers the crucial questions: How good is a will generated by Willmaker 3.0? And do I dare say that I

turn this program loose. It will ask you some questions, then go through and clean up all the citations so they conform to either Bluebook or California style.

The third program, Fullauthority, takes the same brief, examines it, and makes up a table of authorities.

Back about 20 years ago when I taught Constitutional Law, I understood something about legal citation, but I've forgotten all that now. Consequently, I can't possibly tell you if these programs work properly. I can say they appear to work. In the highly unlikely event that I ever write a legal brief, I think I'd be glad to have these programs.

Another program I probably won't use is Songwright. (Fair warning: Someday one of these cutesy names is going to drive me berserk.)

This is a program that runs on a PC with either Hercules or CGA graphics capability and is basically a music composition and editing program. It also transposes, and if you have a MIDI interface, it will play back what you've written.

There are probably a lot of similar programs, although I don't recall seeing too many that run on PC compatibles; most music programs are for the Mac, Atari, or Amiga.

Willmaker throws about phrases such as "powers," "authority," and "discretion" and other bombastic redundancies so beloved of lawyers.

were seems to come in waves. Today I received updates of three programs from Jurisoft Inc. (763 Massachusetts Ave., Cambridge, MA 02139.) One program, Comparerite, I've known for a long time. This program takes two versions of a document, compares them, and marks the changes in one of several ways you can select. The result is a "redlined" document showing deletions and additions. One presumes this is especially valuable for lawyers; I use it in general writing. It's particularly useful for collaborations.

Jurisoft's second program is Citerite II. This program follows the so-called "Harvard Law Review Bluebook," *A Uniform System of Citation*; it also includes the option to use "California style" citations. What happens is that you write your legal brief in the usual way, then

I don't know much about writing music, but I suppose that like writing books, it's hard work, and that a good part of the difficulty is the sheer physical work of writing the stuff down. Under that assumption, a music processing program might do for composers what a word processing program does for writers, namely take much of the tedious physical labor out of the job and leave more time for creative activity. I know that I wrote music. I'd want something like this.

I see I'm out of space. Now what do I do with the rest of this pile?

Jerry Pournelle is a noted science fiction writer and computer columnist. His latest best-seller is The Legacy of Heorot by Larry Niven, Jerry Pournelle, and Steven Barnes (Pocket). The views expressed are his own.

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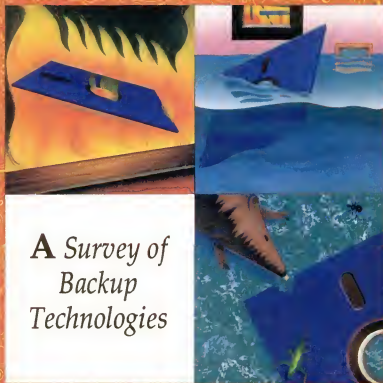
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Product Comparison

PROTECTING YOUR DATA FROM *Fire, Flood, & Pestilence*

BY STEPHEN SATCHELL *Director of Hardware Testing*

A Survey of Backup Technologies



Backup is the task computer users love to hate. You either take the time to do it, or make the time to regenerate lost data. In the long run, backups save you time.

Now that you've decided that regular backup is good policy, do you back up your data on floppy disks? Or do you use some kind of tape, removable disk, or even optical write-once-read-many (WORM) disc?

Unlike most *InfoWorld* product comparisons, this one focuses not on numerous products in one technology, but rather on one or two examples of several types of backup technology available today. It will serve as a guide to trade-offs in performance, ease of use, and price that various technologies offer.

HOW CAN YOU LOSE DATA? A system failure — in RAM, the system board, the video adapter board, the hard disk controller, or the hard disk itself — will prevent you from reading or recovering data from the hard disk. Some failures trash data on the hard

disk, so the data is gone even after the system is repaired.

Software bugs, especially in homegrown applications, can erase data. This is rare with commercial products, but backup is particularly important when any application is used for the first time.

Operator error is by far the most common way to lose data. Miskeyed commands, being in the wrong directory when cleaning off files, and the actions of malicious operators are the prime suspects. All take up valuable time and effort.

PRODUCTS REVIEWED

<i>Microsoft MS-DOS 3.3 Backup/Restore</i>	59
<i>Fastback Plus</i>	60
<i>Bernoulli Box II</i>	61
<i>Irwin Model 445</i>	62
<i>Filesafe 7150</i>	63
<i>Vast VAS2G-9000</i>	64
<i>Laserstor LS800 AT-E</i>	66
<i>InfoWorld Report Card</i>	66
<i>Executive Summary</i>	66

MAKING TIME TO SAVE TIME

The idea behind regular backup is actually quite simple: The more copies you have of your data, the less likely you are to lose it.

It takes time to make backup copies, and that is something you have to balance against the time it would take to rebuild your data.

Data has value. You protect your investment when you have up-to-date copies of all your critical files.

To preserve your data, set up a backup scheme that fits the way you work and stick to it.

For example, our reviewer uses three technologies: floppy disks, magnetic tape, and telecommunicating information to another system.

To protect articles like this one, he periodically copies work in progress to one of five floppy disks in a rotating sequence. When an article is substantially complete, he loads the article to

InfoWorld's electronic publishing system. In addition, he backs up his hard disk weekly on a cassette tape storage drive.

Our reviewer places programming work on project floppy disks. At each major milestone he writes the program onto a backup floppy disk. Once a week, he takes a snapshot of the hard disk onto a cassette tape. He keeps all backup floppy disks in a safe deposit box for off-site backup of critical data and programs.

PICKING PRODUCTS TO TEST. We asked 1,000 InfoWorld readers to choose the backup technologies important to them, and the products that best represent each technology. About half of our readers have a systematic backup plan. The most popular backup methods use 3M digital cartridges (DC-600, DC-1000, and DC-2000); floppy-based backup products come in second. The average reader backs up about 60 megabytes at a time.

The primary issue for our readers is product reliability, which is why our tests stress this so much. Other major issues are speed, capacity, and ease of use.

In this product comparison, we compare technologies more than individual products. We were particularly interested in determining the strengths and weaknesses of representative products of each backup technology.

We break backup technologies into five classes: floppy disk-based, remov-

How We Tested and Scored Tape Backup Systems

The InfoWorld Test Center is geared toward "real-world" testing, so our testing of backup technologies simulated real-world use. We used an IBM PC AT Model 339 running DOS 3.3 with a 30-megabyte hard disk, a Paradise auto-switching EGA card, and an IBM serial-parallel I/O card.

Our hard disk was almost full. The first part of the testing involved the backup and restoration of the entire contents of our 30-megabyte hard disk. This was done twice for timing accuracy. We then compared the files to determine the data integrity of the backup.

During the second phase of testing, we backed up a 512K file 25 times on the same section of media. The longevity of backup media has been questioned in the past, and this test simulated the extended use of media for multiple backups. For consistency, we

used 3M brand media for testing whenever available, so the determining factor was the data format.

For the "torture test," we backed up the entire contents of our 30-megabyte hard disk and stored the backup media under adverse conditions: One set spent a day in the back of a car parked in the sun; another set was placed for one day near a video display. All of the media were placed on a shelf for a week. We then restored the data to the hard disk and compared it to the original data.

Ratings for performance took into account the product's speed, storage capacity, and reliability. We timed each test twice and ranked speed in comparison to the other backup types tested. The capacity score was derived from the amount of data a single piece of media could store. The reliability score was determined by how well the media survived the torture tests: Corrupted

data or damaged media lowered a product's score. Data protection schemes, such as ECC and 48-bit CRC, were considered and were present in all technologies except MS-DOS Backup and Restore.

A satisfactory rating for documentation requires a basic description of the product and how to use it.

To receive a satisfactory score in setup, the user should be able to set up the product in a reasonable amount of time. A good score indicates that the product offers some advantages that make setup simpler.

Products that work with few adjustments or user interaction receive a satisfactory score for ease of use; advantages that increase this score include an excellent user interface and readily accessible options.

To determine serviceability, we rated workmanship, the vendor's support

policies, and the technical support provided. To rate workmanship, we look at how well the product is assembled. To maintain parity with the hardware systems we tested, scores for workmanship of DOS backup software incorporated the necessary hardware, the floppy disk drive system. Support policies include the user's access to support (such as 800 numbers), levels of support available to the user, and the cost of support services. To rate technical support, we call the vendors' support lines and pose as users; we determine how well their representatives can answer questions and solve technical problems.

Weighing performance vs. price determines a product's value. Among the factors we consider are the cost of the product and the media they use as well as other uses of the technology that add value.

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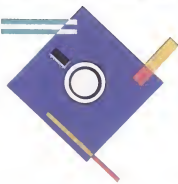
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able hard disk-based, magnetic tape-based, optical disc-based, and other technologies. We looked at seven products, representing three of those classes.



FLOPPY DISK

Floppy disk-based backup systems require little capital investment, ranging from nothing (using the utilities included with MS- or PC-DOS) to nearly \$200 for high-performance floppy backup programs. Most floppy-based products use the floppy drive and controller already in your computer.

The simplest system uses the MS-DOS Copy command to copy a file to a floppy disk. The backup file can be read by applications or transported to another computer. This works only if the file can fit on the floppy. If you have several small, related files, the MS-DOS (3.3) Xcopy command works a bit faster.

When you have more data than will fit on a single floppy disk, you need a backup/restore package such as the Backup/Restore utilities that come with MS-DOS. However, several vendors provide utilities that are faster and more reliable.

All products that use the computer's floppy drive suffer the same problem: you have to change disks manually. When you use 360K floppy disk drives, you need three disks for each megabyte you save. To back up a fully loaded 20-megabyte hard disk you need about 55 disks loaded in sequence. When you use 1.2-megabyte floppy disks, you need 16 disks. If you use 3½-inch media, you need 27 720K or 14 1.44-megabyte disks. That's enough to discourage anyone from performing regular backups.

MS-DOS Backup and Restore

MS-DOS (or PC-DOS) comes with Microsoft's backup programs, Backup and Restore. These two programs get the job done but have limited capabilities. You can select files by name or directory, and

back up files created after a specified date or modified since the last backup.

Of the products we tested Backup was the slowest, requiring more than an hour to back up 30 megabytes of hard disk data. Almost every other product took less than a third of that time. Speed earns a poor rating.

Although Backup uses 1.2-megabyte or 1.44-megabyte floppy disks, you still have to change a great number of them to back up 30 megabytes. Capacity is poor.

Floppy disks and disk drives — the floppy disk subsystem — are generally reliable. The floppies we tested demonstrated a fairly high degree of data integrity. They appeared to be severely affected by the heat-test portion of our torture test; the disks were warped and curled. However, after our technicians placed the actual media in fresh casings,

we were able to read the data on the disks. We rate reliability satisfactory.

Documentation is sparse, consisting of a few pages in the operating system manual — though this may vary from one vendor of MS-DOS to another. We rate documentation poor.

Backup and Restore are automatically installed with MS-DOS. Because it re-

quires, quite literally, no work by the user to install the programs, we rate setup excellent.

A batch file can eliminate the need to key all the parameters every time you run the backup program. However, you cannot leave it to run unattended — a strong deterrent to doing regular backups using this program. Also, doing backups

Total Backup Solutions.



CORE provides total backup solutions. COREfast for diskette and hard disk. COREtape for 40MB minicartridges and 60 and 150MB standard tape units (100 and 250MB available soon). COREtape drives are available in both internal and external models.

Software Solutions. Software drives the backup process. Buy a proven method that works the same way for all backups. CORE's single solution can help you avoid having to learn different systems.

Hardware Solutions. Choose a single solution that will operate successfully on a range of computers. COREtape works with the full line of IBM computers and most compatibles, including internal operation in the PS/2 Models 60/80, and Compaq's 386/20.

Network Solutions. Backup a server across your network to either a diskette, tape or hard disk. Be secure that CORE backup systems support major LAN networks including Novell, 3Com and IBM Token Ring.

COREpower Your Backup. Contact your nearest dealer or CORE representative today.

Northeast Region: 203/357-1339 Southern Region: 407/997-6055

Central Region: 312/439-0511 Western Region: 213/312-8130

International Sales: 407/997-6044, FAX: 407/997-6009

Distribution through KENIL MICRO D. Gates, GBC Distributors and VITRONIX in Canada, contact Markham International Limited



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PRODUCT SUMMARY

MS-DOS 3.3 BACKUP/RESTORE

Company: Microsoft Corp., 1801 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, (206) 882-8089.

List Price: Free with MS-DOS 3.3.
Requires: IBM PC, XT, AT, PS/2, or compatible; 256K of RAM; MS-DOS 3.3.

Pros: Automatically installed with MS-DOS; no additional hardware or software investment required.

Cons: Slow; no technical support available.

Summary: Although Backup/Restore comes with MS-DOS, the user pays a price in the time it takes to do backups. The programs may actually discourage users from making a backup because of its lack of speed and sparse user interface.

consumes large blocks of the user's time. We judge ease of use poor.

We are not impressed with the support Microsoft has given Backup and Restore. The vendor was slow to fix some bugs found after testing. While floppy disk drives and media are reasonably reliable, the quality of the programs is poor. On that basis we rate workmanship poor. Warranties vary from vendor to vendor, but most of them have satisfactory support policies.

Since the programs come with MS-DOS, you get service from the person who sold you the operating system. This is normally your dealer. However, if you run into a bug, there is no one to call. We rate technical support unacceptable. Backup and Restore are attractive because there is no capital investment, but you end up paying a heavy price in

time, changing those floppy disks at the snail's pace that Backup sets. At worst, Backup discourages you from backing up your hard disk. Value is satisfactory.

Fastback Plus

For users who cannot justify buying backup hardware but cannot take the time to use the MS-DOS Backup and Restore, numerous commercial backup programs are available. We looked at one popular program, Fifth Generation Systems' Fastback Plus, a software package that speeds up backup to floppy disk. We tested Version 1.01. Version 2.0 should be released as you read this.

Fastback Plus addresses our hot-button items: speed, reliability, and ease of use. The vendor claims Fastback is the fastest product in its class. Its human interface is well-thought-out, making

PRODUCT SUMMARY

FASTBACK PLUS

Company: Fifth Generation Systems Inc., 11200 Industriplex Blvd., Baton Rouge, LA 70809; (800) 225-2775, (504) 291-7221.

List Price: \$189; upgrade from Version 1.01 to 2.0 is \$20.

Requires: IBM PC, XT, AT, PS/2, or compatible; 320K of RAM; MS-DOS 2.1.

Pros: Easy to install; very fast; writes extra information to allow recovery of data from damaged disks.

Cons: Media offer low storage capacity; unattended operation not possible.

Summary: Fastback Plus is the fastest product in its class. Support is very good. The product's speed and ease of use encourage the user to do backup.

backup less of a drudgery. It also writes extra information to recover data from damaged floppy disks.

Backup speed is affected by three factors: the amount of data per file, whether the floppy disk is already formatted, and how fast you can change floppy disks as they become full. Once our technicians developed a rhythm, Fastback proved to be the second-fastest backup technology we tested. We rate speed very good.

Disk capacity, however, is rated poor. Fastback does not compress data or use other techniques to store more data per floppy disk. Reliability is good. The media stood up well to our torture tests, and Fastback Plus stores extra information to let you recover data from a damaged floppy.

The small product manual is clear, easy to read, and complete. Novices will like the manual's detail, but expert users can skip over things they already know. Although the manual does not have a glossary, we rate the documentation good.

Installing the software is a simple, one-step process. It earns an excellent score for setup. This program is easy to use; it knows you've changed disks and protects against floppy-disk errors. Ease of use gets a very good rating.

This is a well-done software product with a good history. Workmanship earns a very good rating. Support policies are also very good. Fifth Generation offers unlimited support for the product and free upgrades. Technical support is quick and accurate, which earns Fastback a very good score.

The \$189 list price for the program seems excessive at first — after all, you get a "perfectly suitable" backup program free from Microsoft. After working with the package, however, we feel the software is worth it. It encourages backup because it tries to make the job as painless as possible. We therefore rate value good.

Black Monday Can Teach Us A Lot About Hard Disks.

If anyone tells you your computer's hard disk will never crash, just remember that, not too long ago, Wall Street was saying, "A stock market crash could never happen again."

Though there may be no way to totally protect your financial investments, protecting data on your hard disk can take as little as a minute a day with FASTBACK PLUS.

In fact, backing up a full 10 megabytes takes no more than about 4 minutes* and that makes FASTBACK PLUS the world's fastest backup program.

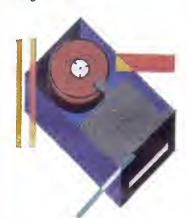
Unsurpassed features like data compression to cut the number of backup disks in half, advanced error correction, easy to use graphic display and support for DOS 3½ inch and 5¼ inch floppies, have helped make FASTBACK PLUS

the overwhelming favorite backup utility. To keep your data from a crash that could be almost as costly as Black Monday, use FASTBACK PLUS — it just might be one of the best investments you'll ever make.

A Minute A Day Keeps Disaster Away



Macintosh Version Now Available



REMOVABLE HARD DISK

Some applications require instantaneous backup should a drive or controller fail. Mirroring makes a copy at the same time original data is written. We have not yet seen a complete mirroring system for personal computers.

Personal computer users can take a large disk and partition it into several equal-sized areas. Users work out of one partition, and all work is copied to another partition. Should anything happen to the working copy, it can be restored quickly from the other partition. This backup method is vulnerable to any system hiccup, particularly a failure in the hard drive.

If a hard disk is on-line, any system glitch can corrupt the information contained on it. However, when you can take

*With PC AT or equivalent.
XT machines may take longer.

Fifth Generation Systems, Inc.

11200 Industriplex Blvd., Baton Rouge, LA 70809

Sales Office: 1322 Bell Avenue, Suite 1A, Austin, TX 78760 • (800) 225-2775 • (714) 259-0541

the disk off-line it becomes far more useful as a backup medium.

Disk drives with removable media have been around since the early 1960s when they were the primary storage media for mainframe computers. Since then, removable disk technology has continued to advance. The sealed fixed disk that is permanently mounted inside the system unit is starting to replace the much larger, more expensive removable systems.

For desktop computers, you can still get controllers for storage module device (SMD) drives. The drives are huge, and the 150- and 300-megabyte drives require three-phase power. These drives also cost more than your computer.

Just as computers have decreased in size, so have removable hard-disk systems. Several vendors, such as Ideasociates, incorporate the Syquest 10- and 20-megabyte removable disk drives in products that are targeted at desktop computing.

The newest wrinkle in "removable" hard disks is to place a sealed disk drive in a case that can be plugged into the system unit. Tandon makes the Tandonpak. SPC Systems makes a similar product that can also be used with portable computers such as the Toshiba T1100 Plus.

Bernoulli Box II

Some people consider the Bernoulli Box II from Omega a floppy disk because that is exactly what is inside a Bernoulli cartridge. The Bernoulli Box spins this disk at about 1,500 rpm — five times faster than a regular floppy drive.

Most people, however, consider the Bernoulli Box a removable hard disk because its capacity is equal to many hard disks. Also, unlike floppy disk-based backups, the Bernoulli Box II is an add-on system.

The Omega Bernoulli Box II holds 20 megabytes per disk cartridge, but it requires its own drive, adapter board, and software. If you use the Bernoulli drive as a DOS drive, you can then use a compression/archive program to save considerably more than 20 megabytes of data on a single cartridge.

The Bernoulli Box II was the fastest in our speed tests. This earns it an excellent score for speed. Each cartridge holds 20 megabytes, which means you can easily hold an incremental backup on one

cartridge. This earns it a score of good for capacity. The Bernoulli Box earns an excellent score in reliability: The Bernoulli cartridge was the only one to survive all our tests without a glitch or bobble.

Omega's clear and complete manuals receive a very good score for documentation. They cover the four basics completely: installation, operation, troubleshooting, and customization.

Expect to spend a little time installing the drive, controller, and software. Installation is not difficult, but you need to take the time to do it right. Overall, we rate setup good.

Operating the Bernoulli drive requires more attention than some of the other systems, but the format, backup, and restore programs handle most of the details. The backup program is short on options, offering backup by name, starting date, or archive status. Because you swap media only to do full backup, the Bernoulli box scores very good for ease of use.

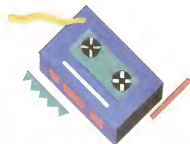
The Bernoulli Box II is durable and well-made, with attention to design and manufacturing details. We rate workmanship good. Support policies are satisfactory. Omega offers a one-year limited warranty on the drive and 90 days for the media. Technical support earns a good score for competent responses to our questions.

The Bernoulli Box II is available as a dual-drive external unit that can handle 40 megabytes at a time for \$2,350, and as a single-drive internal unit with a 20-megabyte capacity for \$1,100. Its cost per megabyte is the highest among backup

technologies, based on the price of the drive or the cost of the media.

For that price, however, you can use Bernoulli drives just like removable hard disks. This means you can make backups quickly and use them immediately.

On the whole, we rate the value of the Bernoulli Box II good.



MAGNETIC TAPE

Magnetic tape is the oldest data storage technology in use today. Judging from the advances in tape technology, magnetic tape will be with us for years to come.

For business applications on desktop computers the most common types of tape systems are the data tape cartridge, 8-millimeter helical-scan tape, and the 9-track reel-to-reel computer tape used on mainframes and minicomputers.

Reel-to-reel tape was standardized in the 1960s. Current 2,400-foot tapes (using expensive 6,250-bpi group-code recording) can hold up to about 170

PRODUCT SUMMARY

BERNOULLI BOX II

Company: Omega Corp., 1821 W. 4000 South, Roy, UT 84067; (801) 778-3170.
List Price: \$2,350.

Requires: IBM PC, XT, AT, PS/2, or compatible; 128K of RAM, 256K recommended; MS-DOS 2.0.

Pros: Can be used both as a backup and a primary storage device; largest capacity among floppy disk-based technologies.
Cons: Has highest cost per megabyte of all tested products.

Summary: The Bernoulli Box II is a floppy disk drive that spins the disks five times faster than a standard floppy drive. It can be used as your primary storage device or like a removable hard disk. However, it has very high capital and media costs per megabyte.

HOW TO PROTECT YOURSELF FROM THE NEXT CRASH.

megabytes of data; extended-length 3600-foot tapes hold over 200 megabytes.

While reel-to-reel tape is fairly inexpensive — from \$15 for a 7-inch reel to \$35 for a 10½-inch reel — the transports start at around \$4,000. Users have to thread the tape in the transports, which are fairly large.

Cassettes and cartridges are considerably easier to use and handle. There is no tape to thread, and all of the currently available media fit in a standard file cabinet.

The newest tape technology borrows heavily from video tape systems. By using helical scanning, a tape cartridge about the size of a pack of cigarettes can store more than 2 gigabytes (2,048 megabytes) of data.

What about adapters that turn your

VCR into a backup tape drive? They are available, but they are difficult to use.

Irwin Magnetics Model 445

The Irwin Magnetics Model 445 streaming tape drive is an external unit that plugs into the floppy controller through an adapter card. It takes up little room and uses DC-2000 data minicartridges. These cartridges are a handy size for desktop computers.

The Irwin drive took more than twice as long to back up 30 megabytes as the other products we reviewed; only MS-DOS's Backup was slower. We rate speed poor. However, capacity earns a very good score for handling 40 megabytes at a time.

Reliability is a problem. During our tests we backed up an entire 30-megabyte hard disk twice on the same tape; the tape

failed during the second restore operation. The system hung up several times during backup and restore operations. In one instance we were able to restore only by using selective file restore. Technical support at Irwin states that these are software problems; some may be traced to setup, hard-disk partitioning, or RAM limits.

We also had problems with the media. In one instance we were unable to read data we had backed up. Irwin recommends its own 3M DC-2000 tapes that claim to test to specification. However, they don't require the use of their own tapes. We rate the Model 445's reliability unacceptable.

The documentation is skimpy, omitting complete symptom/cause charts and a glossary. However, the sections on installation and operation are clear. This

PRODUCT SUMMARY

IRWIN MODEL 445

Company: Irwin Magnetics Systems, 2101 Commonwealth Blvd., Ann Arbor, MI 48105; (800) 348-6242.

List Price: \$795.

Requires: IBM AT; 512K of RAM, 640K recommended; MS-DOS 2.0.

Pros: Capable of backing up 40 megabytes at a time; unit has good workmanship.

Cons: Documentation is not comprehensive; installation is difficult; unit hung up frequently.

Summary: The Irwin Model 445 offers a small footprint and handy-size tapes. However, it was slow and hung up frequently for various reasons.

BACKUP TECHNOLOGIES • FEATURES CHART

	FLOPPY DISK		REMOVABLE HARD DISK	MAGNETIC TAPE			OPTICAL
	Microsoft MS-DOS 3.3 Backup/Restore	Fifth Generation Systems Feedback Plus	Iomega Bernoulli Box II	Irwin Magnetics Model 445	Mountain Computer FileSafe 7150	Emulard Systems Vast VAS26-9000	Storage Dimensions LaserStar LS300 AT-E
Capital cost	\$0	\$189	\$2,350	\$189	\$2,295	\$6,995	\$4,495
Media	Floppy disk	Floppy disk	Floppy disk	DC-2000 tape	DC-600XTL tape	8mm tape	Optical
Media cost	\$0	\$0	\$83	\$23	\$59	\$325	\$150
Media capacity	1.2 megabytes	1.2 megabytes	20 megabytes	40 megabytes	150 megabytes	2.2 gigabytes	800 megabytes
Capital cost/megabyte	\$0 ¹	\$157.50 ¹	\$58.75	\$19.88	\$19.80	\$3.11	\$5.62
Media cost/megabyte	\$2.08	\$2.08	\$4.15	\$0.58	\$0.39	\$0.14	\$0.19
Time/megabyte ²	129	28	24	72	30	46	39

¹ Based on capacity of one floppy disk.

² In seconds; includes time required to change media if necessary.

MOUNTAIN'S FILES. HARD DISK CRASH.

Don't lose valuable computer files due to hard disk crash or operator error. Protect yourself with Mountain Computer's new tape backup system, FileSafe™. The only system that backs up your data automatically. Even while your IBM® PS/2® XT® AT® or compatible is working on other tasks.

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Four ways to get our most economical units, with convenient, pocket-size DC2000 cartridges.



rely on daily to protect their irreplaceable data.

And Mountain supports the most popular single and multi-user operating systems.

Plus local area networks like Novell, PCnet™, TOKEN RING™ and many more.



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60MB, high-speed tape backup systems using the popular DC2000 cartridge

MOUNTAINS OF CRASH PROTECTION FROM 40-600MB.

Now you can have 40, 60, 150 or 300 megabytes of tape cartridge backup in one internal or two zero-footprint external versions.

Daisy-chain up to two 300-megabyte systems and get a whopping 600 megabytes of tape backup!

Just what you need for storage-intensive applications like desktop publishing and data base management, or for file servers.

Every FileSafe system includes Mountain's latest generation of powerful, automatic, menu-driven tape backup software that tens of thousands of professional, business and government systems users

well-written but lightweight manual earns a satisfactory score.

Installing the unit is a long and difficult job. The process is involved and sometimes confusing because the documentation does not provide enough information about setting some of the jumpers. However, for standard installation you shouldn't have major problems. The Irwin system gets a satisfactory score for setup.

Once installed, the drive did not work flawlessly. The system hung up for various reasons quite frequently, and we had some problems during restore operations. Because of these, we downrate the ease of use to poor.

The unit is well-made and should last. Cables are generously long, so you can place the drive where it will be protected. We rate workmanship good. Support policies are also good. A one-year warranty is backed by a toll-free support number. Irwin-certified cartridges are guaranteed for two years. Technical support is good. The technicians answered our questions quickly and, for the most part, accurately. However, they didn't know the product thoroughly.

The drive is inexpensive at \$795, and 40-megabyte cartridges are available through office supply and computer stores for \$20 to \$25. Media life is a problem. Because of the problems we experienced, we rate value of the Irwin 445 poor.

Mountain FileSafe 7150

Cartridge tape has been around for about 20 years. First developed by 3M Corp., data cartridges found wide acceptance

PRODUCT SUMMARY

FILESAFE 7150

Company: Mountain Computer Inc., 240 Hacienda Ave., Campbell, CA 95008; (408) 438-0300, (408) 379-4300.
List Prices: \$2,295; \$2,395 with Micro Channel bus.

Requires: IBM PC, XT, AT, PS/2, or compatible; 320K of RAM, 640K recommended; MS-DOS 2.1.

Pros: Fast; operation can be left unattended after user initiates it; large storage capacity.

Cons: Fairly high capital cost per megabyte; documentation lacks operator quick-reference guide.

Summary: The Mountain FileSafe has a high capital cost per megabyte but one of the lowest media costs per megabyte. Larger storage systems — network file servers, desktop publishing systems — will take advantage of its capacity and justify its cost.

with smaller systems — particularly workstations.

The capacity per tape keeps rising. With the DC-600XTL tape, the Mountain FileSafe 7150 holds 150 megabytes of data on a single \$39 cartridge.

In our 30-megabyte backup test the Mountain 7150 paced the Bernoulli Box II and Fastback — the two fastest technologies. Unlike them, however, once the backup operation is started it proceeds unattended. Speed earns a score of very good. Since the tape is larger than most hard disk drives, we rate capacity excellent. The data cartridge survived our heat and magnetic stress tests, but when

The Care and Feeding Of Backup Copies

Any storage medium can lose data if it is abused enough. Although our tests concentrated on heat and magnetic fields, backup copies can be lost to dust and dirt, coffee, tea, and other debris and physical damage (such as rolling a chair over a floppy disk).

We recommend some common-sense rules when squirreling away backup copies:

- Store the media in a dust-free place whose temperature stays between 50 to 100 degrees.

- Keep three generations of data.
- Spot check to be sure the backup copy just made can be read.

- Replace backup media every year or so.

- Regularly make a copy to be stored at home or in a bank safety deposit box.

- Keep media, especially magnetic tapes, away from magnetic sources such as monitors and speakers.

- Most important, develop and use a system of making backup copies.

we tried to restore from the abused cartridge, the tape-handling system mishandled the tape and crumpled it. We were unable to recover all the data off the crumpled tape. On the whole, however, reliability is good.

Mountain's documentation earns a good rating. Although expert installation instructions and an operator quick reference are missing, Mountain includes everything else.

We had no problems installing the controller and connecting the drive; it took us 20 minutes to do the job. Software installation and configuration are automated. You do, however, need to set jumpers for the system you are installing the 7150 into. Setup earns a satisfactory score.

Ease of use gets a good score. Media

are widely available from office and computer supply companies. You can automate backup. The software offers several ways to select files to back up.

One word describes the 7150: clean. Workmanship earns a score of very good.

Mountain offers a one-year warranty through its repair centers. Support policies are satisfactory. Technical support is very good. We were impressed by how quickly the technicians identified our problems.

If you have larger storage systems — especially on network file servers and desktop publishing or graphics workstations — spending \$2,295 for the 7150 makes sense. Media cost is a low 39 cents per megabyte if you fill the 150-megabyte tape. Mountain FileSafe 7150 is a good value.

TAPE BACKUP-PROTECTION.

PLAY IT SAFE WITH FILESAFE.

An industry leader for over a decade, Mountain backs all FileSafe systems with a full 12-month limited warranty. And a worldwide reputation for responsive service and support.

For the widest range of high-performance tape backup for your PC, look to Mountain. We'll help you keep your data safe from the next hard disk crash. Just ask for FileSafe.

For more information and the name of your nearest FileSafe dealer call toll-free today.

No one backs you up like Mountain.



FileSafe 300/600
Daisy-chain up to 600MB — the highest capacity in high-speed tape cartridge backup.

FileSafe 150
One cartridge covers nearly every size hard disk system.



For more information and the name of your nearest FileSafe dealer call toll-free today. No one backs you up like Mountain.



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Emerald Vast VAS2G-9000

How much information can a video tape cassette hold? It's staggering. Emerald's Vast stores 2.2 gigabytes on a single 8-millimeter camcorder-style cassette that fits in your pocket. The drive, however, is a rather large box.

The Vast uses helical-scan technology that writes data diagonally on the tape as the drive heads move across it, just like your VCRs. This allows the unit to write lots of data onto a slow-moving tape.

The Vast unit was a little slower than other technologies saving 30 megabytes. If we saved 10 times as much data, it might have run faster. Speed is satisfactory. Capacity is excellent. If you don't have a gigabyte on-line, consider purchasing the smaller 250-megabyte cassettes. Reliability is satisfactory. The drive writes the data on the tape several

Nobody really knows the shelf life of WORM media and data, but manufacturers say that data will still be readable five years or more from now.

times so that you don't lose data on any bad spots. The Vast cassettes passed our heat test with ease, but they were affected by the magnetic field put out by our monitor. Treat these cassettes as you would your VCR tapes.

The documentation is not designed for the first-time user — not surprising when you consider few tenderfeet need

this much backup. However, the manual is complete and well-written and merits a good score.

Installing the Vast drive is simple but tedious. In 15 minutes it was working in our test system. We rate setup good.

The Vast device is very straightforward to operate. The backup software offers the capability to select files by

PRODUCT SUMMARY**VAST VAS2G-9000**

Company: Emerald Systems Corp., 4757 Morena Blvd., San Diego, CA 92117; (609) 553-4030, (619) 270-1994 in CA.

List Price: \$6,995.

Requires: IBM AT, PS/2, or compatible or Compaq Deskpro; 640K of RAM; MS-DOS 3.0.

Pros: Offers up to 2.2 gigabytes of storage per tape; easy to operate.

Cons: Tapes affected by magnetic fields; documentation not geared to novice users.

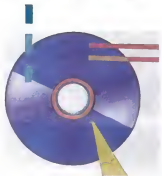
Summary: The Vast is a rugged, high-capacity backup device. Its use in large networks, multiuser systems, and graphics workstations can justify its high capital cost.

name, date, and backup status. Ease of use is very good.

The Vast device is rugged. It is also well-made, earning the Vast an excellent score for workmanship. Support policies merit a very good score. Emerald backs up the one-year warranty by paying the shipping costs both ways and providing a loaner unit if needed.

Technical support earns no more than a good score. Our questions were answered quickly, and the technician volunteered helpful information. During another support call, however, we asked the technician if we could substitute standard 8mm videotapes for their media; his answer was a flat "I don't know," and he made no effort to find out.

Do you need this much capacity? If not, the rather steep \$6,995 price tag (plus \$325 for media) rules the Vast out. However, file servers on large networks, multiuser systems with lots of storage, and graphic workstations can use what Vast has to offer. The 2.2-gigabyte capacity fills the needs of high-end systems. The cost per megabyte is the lowest of the devices we tested. Because of this, the Vast is a very good value.

**OPTICAL DISC**

Most storage systems allow you to erase and reuse media. For some applications, this is not acceptable: Accounting firms need to keep financial records for at least seven years. When an audit trail is a must, optical write-once-read-mostly (WORM) technology is ideal.

WORM data capacity can be staggering. A 5 1/4-inch optical disc can hold 200 megabytes; larger optical discs can hold 2 gigabytes. The media are fairly inexpensive, and the cost of the drives is coming down.

Once you write data on a WORM, it is there forever. Nobody really knows the shelf life of WORM media and data, but manufacturers say that data will still be readable five years or more from now.

If you don't need such permanent

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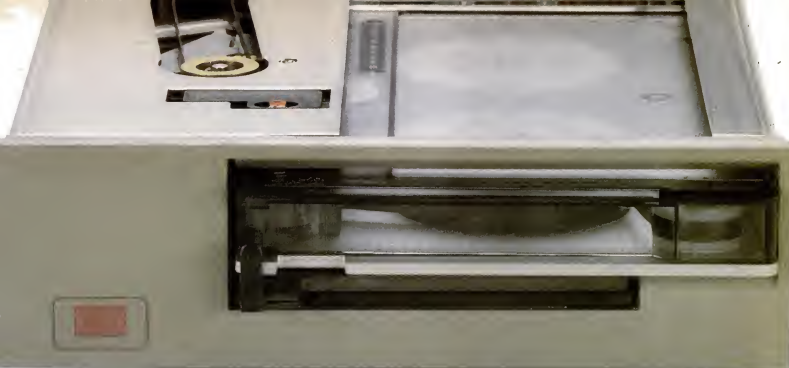


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Everex has been an industry leader since 1984, providing a variety of tape backup systems to meet your data security needs. Our external tape units are perfectly suited for sharing among several users because they can be easily transported from desk to desk. The popular half-height, internal units are designed to fit inside 5 1/4-inch disk drive slots. There's even a mini-cartridge drive that fits right into a disk drive slot and runs off an existing floppy controller.

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PC/XT/ATs, compatibles and PS/2s, you can cut down on your backup costs by using one Everex tape backup unit. Just put a special controller card in each computer and share the tape unit among them.

When you buy an Everex tape backup system you get everything you need including manuals, software, blank tape, a cable and a controller card. This isn't true with other tape units on the market today—their extra costs can add as much as \$250 to a system.

When it comes to insuring your data, it's easy to see why **Everex has the answer.**

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storage, erasable optical discs are just now becoming commercially available. These systems may be more suited for main storage instead of backup. However, some of the new WORM drives use removable media that may make mirror-disk systems practical for desktop computers in the near future.

Storage Dimensions Laserstor LS800 AT-E

Of all the backup products we looked at, the WORM drive from Storage Dimensions uses the newest technology: optical storage. This technology is unique because it is nonvolatile; once the data is written, it cannot be erased. This has its good side and its bad side. You cannot reuse the media, so it must be treated as a consumable item. Since it cannot be erased it is ideal when you need to keep a history or store files for long periods of time. Accountants like WORM drives to save tax information since the data has to be saved for seven years.

Speed is good. Although not as fast as Fastback Plus or the Mountain Computer Filesafe 7150, the WORM drive saved just under 2 megabytes per second without a problem.

Capacity is very good: You cannot fill 800 megabytes overnight! You can, however, waste space by saving too many versions. Storage Dimensions has a version that incorporates a hard disk. With it you can save interim versions of files to the hard disk, snapshot that to the WORM, and put the optical disc on the shelf.

Reliability is excellent. We couldn't find a way to casually damage the media such that we lost data.

Storage Dimensions has some of the best documentation in the business, and it reinforces that reputation with the Laserstor manual. It is complete, well-written, and has some extra information for programmers who wish to develop special applications. Documentation earns a very good score.

Setup is very good. MS-DOS users need only to install the controller card

PRODUCT SUMMARY

LASERSTOR LS800 AT-E

Company: Storage Dimensions, 2145 Hamilton Ave., San Jose, CA 95125; (408) 879-0300.
List Price: \$4,495.

Requires: IBM PC, XT, AT, or compatible; 384K of RAM, 640K recommended; MS-DOS 3.0.

Pros: Offers nonvolatile storage; provides high capacity; very reliable.

Cons: Media are not reusable; fairly high up-front costs.

Summary: The Laserstor provides the permanence of storage that accountants and similar users need. Although the media are expensive, their capacity lowers the media cost per megabyte significantly. Reliability is excellent.

and software. But only Storage Dimensions gives you source code to other operating systems to build programs to work with the drive.

The drive looks just like another MS-DOS drive, although you also get a backup and restore program. Ease of use is very good.

Workmanship is very good. We like the clean design and superior manufacturing. Support policies earn a satisfactory score. Laserstor comes with a one-year warranty. Technical support is good. The technicians gave us accurate answers to our questions and seemed to know the product well.

Before you decide to purchase this WORM drive consider that you can use the media only once. However, this provides a permanence some users require, such as those in the accounting and financial industries. This WORM can be used as a read-only hard disk drive in its own right.

If you need permanent data storage, this WORM drive is a very good value at \$4,495 (plus \$150 per 800-megabyte cartridge). We recommend a tiered scheme for backup, using the WORM drive as second-level backup. This optimizes this nonreusable medium.

Executive Summary

We were struck with the many ways you can protect your data by making backup copies. Each method is tailored for a particular situation, but using several well-chosen techniques can give you complete security at a low cost.

Floppy media are perfect for saving small amounts of data on a regular basis. It's inexpensive, it's simple, and the media proved to be rugged. We recommend you use 1.2-megabyte media where possible instead of 360K media, since the higher density media are more resistant to accidental erasure by monitors and other peripherals that generate magnetic fields.

In the floppy disk class, we looked at MS-DOS Backup/Restore, Fifth Dimension's Fastback Plus, and Imega's Bernoulli Box II. Quite frankly, we feel MS-DOS Backup discourages users from performing backups; Fastback is a far superior product.

A hard disk is susceptible to any glitch in the system. Taking the disk offline makes it useful as a backup medium. Removable hard disk systems, once used only for mainframe computers, are being scaled down for use with desktop systems.

The Bernoulli Box II is expensive — the most expensive technology per megabyte we tested — but in networks and multiuser systems it makes incremental backup easy. Its performance matches that of fixed hard disks and thus can be used also as a primary storage medium. Many users consider it a removable hard disk drive.

Tape backup is the technology of choice today, and you would be well-advised to use the 1/4-inch DC600-series data cartridges. The 1/4-inch DC2000 cartridges are smaller, but we found they don't hold up. Low-priced DC600 cartridge drives hold 60 mega-

bytes; network users should look at DC600XTL drives.

In the magnetic tape class, we prefer the DC600 data cartridge-based products, such as the Mountain Filesafe 7150, over the smaller DC2000 mini data cartridge (represented here by the Irwin Model 445).

If you need to save lots of data from file servers, Emerald's 8-millimeter tape VAST device, which borrows VCR technology, does the job by saving more than 2 gigabytes on a tape, but you have to be careful how you store VAST tapes.

More exotic media such as 8-millimeter tape and optical media have their place, but make sure you need that much storage capacity and, in the case of optical WORM drives, the permanence.

Optical WORM has its place when you have to save data for long periods. Accounting firms, for example, love this technology for saving tax data. However, you should be careful how you use WORM — if you back up too often, you waste media; if you back up too seldom, you have a bigger reconstruction job.

InfoWorld's recommendation is to use several technologies together to protect your data. Consider using floppy disks daily, magnetic tape weekly. If you rotate five tapes and 10 high-capacity floppy disks (if this is enough to handle all the changed files), you have five generations of your data over five weeks, plus copies of changed files.

Consider making a full backup copy "out of sequence" after you complete a major project — this can save you hours of trying to reconstruct last-minute changes. Consider also writing project backup copies on floppy disks.

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BACKUP TECHNOLOGIES • REPORT CARD

	FLOPPY DISK	REMOVABLE HARD DISK	MAGNETIC TAPE	OPTICAL
	Microsoft MS-DOS 3.3 Backup/Restore (Weighting)	Fifth Generation Fastback Plus Imega Bernoulli Box II	Irwin Magnetics Model 445 Mountain Computer Filesafe 7150	Emerald Systems VAST-9000 Storage Dimensions LS800 AT-E
Performance				
Speed (125)	Poor	Very Good	Poor	Very Good
Capacity (125)	Poor	Good	Very Good	Excellent
Reliability (200)	Satisfactory	Good	Unacceptable	Good
Documentation				
Setup (75)	Poor	Good	Satisfactory	Good
Ease of use (75)	Excellent	Excellent	Good	Satisfactory
Serviceability				
Workmanship (100)	Poor	Very Good	Good	Very Good
Support policies (50)	Satisfactory	Very Good	Satisfactory	Very Good
Technical support (100)	Unacceptable	Very Good	Good	Good
Value (100)	Satisfactory	Good	Poor	Good
Final scores	3.6	6.7	7.6	3.8

GUIDE TO REPORT CARD SCORES

InfoWorld gives ratings to finished production versions of products only, never to beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

Excellent = 1.0 — Outstanding in all areas.

Very good = 0.75 — Meets all essential criteria and offers significant advantages.

Good = 0.625 — Meets essential criteria and includes some special features.

Satisfactory = 0.5 — Meets essential criteria.

Yad = 0.25 — Falls short in essential areas.

Unacceptable or **N/A** = 0.0 — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10 (plus bonus). Products rated within 0.2 points of one another differ little.

First Look

By Michael J. Miller

Communications Coprocessor Uses CAS Standard to Simplify Fax Procedure

In the past year or so, the concept of facsimile transmission seems to have really taken hold in the United States. Where fax machines used to be fairly rare, they are now commonplace. And many personal computer users are now considering fax boards — communications boards that fit within your computer and let you transmit and receive fax files, including both text and graphics.

Fax transmission offers a number of benefits over traditional modem communications. You can easily transmit graphics as well as text. And you can transmit to people who don't have a modem but who do have a fax machine, which includes most businesses. The fax standard applies to both domestic and international communications; indeed, fax communications are more common overseas.

All this applies to fax boards as well, but there are some problems. First of all, a fax board really isn't a substitute for a fax machine. To input graphics, you need a scanner, and to print files, you need a graphics printer, usually a laser printer. And fax boards typically have only worked in the foreground; when you used your computer for something else, you couldn't receive a fax in the background. Finally, although you can send files from your computer using the fax, usually you have to save the file, exit your application, and start up the fax board's communication software.

The Intel Connection Coprocessor board, the first to implement the new DCA/Intel Communications Application Standard (CAS), addresses many of

these concerns. First of all, the board contains its own central processor, so it can work in the background, sending and receiving faxes while you use your computer for other things. (Other fax boards, such as those from Panasonic, have had this feature.) Secondly, the CAS standard defines a way for applications software to communicate through a fax board, so you could, for instance, write a document and send it via fax from within the word processor. The CAS standard should eventually support other communications hardware as well, including networks and micro-mainframe links.

SOME LIMITATIONS. Considered just as a fax board with background communications, the Intel Connection Coprocessor has both strengths and weaknesses. The base Connection Coprocessor board includes a 9,600-bps fax modem that lets you send and receive faxes with other Group III fax machines and fax boards. You can also use it as a standard 9,600-bps modem for sending text and binary files, but only to other Connection Coprocessor boards.

The board's biggest strength is its capability to work in the background since it is essentially a separate computer, complete with a 10-MHz 80188 microprocessor and 256K of memory. Once you tell the board to send a fax or message, or to receive faxes and messages, it works independently of your computer's CPU (though it does use your computer's power and hard disk). This is important because you can set it up so it always receives fax messages and acts

more like a dedicated fax machine.

The board also comes with a piggy-back slot for adding options — the initial choice being a 2,400-bps Hayes-compatible modem that worked quite well.

The software that accompanies the Connection Coprocessor includes a TSR that activates the board and the CAS protocol, as well as a separate non-RAM-resident program that you use to send and receive faxes. This is all menu-driven, and it includes a nice phone book that you can set up with individual names and phone numbers, as well as lists of up to 999 names for sending information to a set group of people.

Unfortunately, the software supplied for viewing and editing the graphic images you receive via faxes — Zsoft's PC Paintbrush — isn't as convenient as I'd like. It's a fine paint program, but its user interface is quite different from the other software supplied with the board (it really requires a mouse), and it isn't as efficient or fast for viewing faxes as some other fax editing software.

Being run in the background, the most impressive part of the Connection Coprocessor is just how well the CAS standard works. Using a pre-release driver for Symantec's Q&A file manager, I was able to send individual and even mail-merged documents via fax, using the standard procedure for printing. In Q&A's printer installation routine, you simply select the fax board (in one of four different configurations) as one of your printers; then, when you're ready to send your fax, you choose that "printer." The program prompts you for the name and

phone number of your destination. It's really quite simple, and it is much easier than the process you go through with other fax boards.

Currently, this procedure works only with text, not graphics. That would be a nice addition, as would be the capability to access the Connection Coprocessor's phone book, rather than typing in the name and phone number individually (for mail-merged lists, you can choose the number from a particular field).

My biggest problems with the Connection Coprocessor involved compatibility. In its current version, the software seems incompatible with multitasking operating environments such as Windows 386. More troubling (although the board and modem offer a number of choices for setting interrupts, DMA channels, and COM ports), I was unable to resolve compatibility problems with a network consisting of 3Com Etherlink hardware and Novell software.

CONCEPTUAL SOUND. While compatibility remains a problem, the basic hardware worked well, the software was adequate, and the concept is quite additive.

The Intel Connection Coprocessor has a list price of \$995; the optional 2400B modem is \$295. Both should be available later this month from Intel Personal Computer Enhancement Operation, 5200 N.E. Elam Young Parkway, Hillsboro, OR 97124-6497; (800) 538-3373

First Look examines new personal computer products before they have been through a formal review.

Short Looks

Short looks are quick, initial looks at products by members of InfoWorld's review staff and the InfoWorld Review Board. They are not intended to be full reviews of the products.

EMERALD INTERNAL TAPE BACKUP SYSTEMS

Users who need high-capacity backup but have limited desk space have two new choices. Emerald Systems has added two internal tape backup systems: the model 60-2000 with a 60-megabyte capacity and the 150-2000 with a 150-megabyte capacity. Both mount in a standard half-height slot and use DC-600 tapes. They use Emerald's ASP software and support DOS, Netware, and Xenix.

I tested the model 150-2000 on an 8-MHz IBM PC AT with 640K of RAM and a 30-megabyte hard disk. I found it to be a well-made and functional drive. However, it suffers from a few software problems and marginal documentation. It is also moderately noisy.

Installing the 150-2000 was fairly painless. The instruction book explains the process in detail and is more than adequate for anyone who has installed add-in cards. Unfortunately, the instruction book has no diagrams, line drawings, or photographs to aid the novice user. Emerald provided plenty of cable to connect the card and the drive, which I mounted below the AT's 1.2-megabyte

floppy drive. You may need to set the I/O address, which is set by DIP switches mounted conveniently on the upper edge of the card.

Software installation was quick and simple. You copy two files from a 5¼-inch floppy to the hard disk: the ASP backup/restore program and a diagnostics program that checks the read/write function of the drive and tape. (A bonus would have been automatic installation, or instructions for novices on how to create subdirectories and copy the files.)

The manual briefly discusses setting the I/O address, DMA, and interrupts. The standard settings should work for a basic PC AT setup but may have to be changed for systems on a network or systems containing expansion cards.

There are some real problems with both the documentation and the software. The manual has few details on setting DMA or interrupt settings for various hardware configurations. You may have difficulty working out the right combination. The manual suggests consulting the PC technical manual for the correct DMA and interrupt settings. Very few users (or dealers, for that matter) possess or understand the manuals. Therefore, unless you have a stock PC AT or are very familiar with setting DMA channels and interrupts, you will probably call Emerald tech support.

Once the hardware and software are installed, doing backup is simple. Type

"ASP" and the main menu pops up, with the commands: Backup, Restore, Directory, Tension, Erase, and Quit.

When backing up all files, you can provide a command and a password. You can also back up individual files, groups of files, or subdirectories, as well as files modified after a given date. The program does not show a directory of the hard disk, so you will need to know exact file names, subdirectories, and path. The directory selection shows a list of backed-up files.

I ran into difficulty the first time I tried a full backup. It took over an hour to back up 30 megabytes. After a day of checking the system and two calls to tech support, I ran CHKDSK and cleared out several bad files. The average time for a full backup on our PC AT from then on was 22 minutes. Restoring the 30 megabytes took an average of 42 minutes.

Backup and restore functions can be automated. The ASP software has a learn mode that records your keystrokes and saves them on file. A time delay is also included so the system can begin a backup uninterrupted.

The 150-2000 has a one-year warranty; repairs are handled by Emerald. The firm claims that most units are repaired and shipped within 48 hours of receipt. An extended warranty and on-site service are available through CDC service centers. Media purchased through Emerald have a lifetime warranty.

Technical support is free, but the phone call is not. The tech support department is open normal business hours Pacific time. My experience with

tech calls to Emerald was mixed. My first call resulted in a small bit of information before being placed on hold. I made several more calls over the next three days to get additional help, each time I had to repeat the information I had left before. I finally talked to a very helpful technician who went into detail and promised to send some notes on backup speed problems. These actually arrived.

The model 150-2000 has a list price of \$2,095. The basic kit includes the half-height drive, a half-slot ESDI card, data cable, power splitter, and a drive mounting kit for AT and Compag systems. It also includes an instruction book, software on 5¼-inch disk, and five color-coded 150-megabyte tapes for daily backup.

In summary, the drive appears well-constructed and durable. Installation is well-documented and fairly easy. The software is menu-driven; the basic backup and restore functions work. System configuration is somewhat cumbersome. Error handling is not bulletproof. Aborting a backup or restore sometimes hung up the system or threw us back to the DOS prompt. The documentation was barely adequate. There was no index or tech support information.

The Emerald 150-2000 is a high-capacity internal backup system that will reliably archive your data. It is not, however, the most polished product in the tape backup market.

Emerald Systems, 4757 Morena Blvd., San Diego, CA 92117; (619) 270-1994.

— Tracey Capen



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Software Reviews

REVIEW SCORING

InfoWorld reviews only finished, production versions of products, never beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

Excellent = 1.0 — Outstanding in all areas.

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Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of maximum possible score of 100 (plus bonus). Products rated within 0.2 points of one another differ little.

Average score (1987) for all products reviewed: **6.5.**

INDEXES

Indexes appear in the first issues of January, April, July, and October. For back issues, specify dates and send \$2.95 per issue to InfoWorld Customer Service, P.O. Box 5994, Pasadena, CA 91107. Please allow six weeks for delivery.

Target Editions are sent only to volume buyers of target products.

Also Included
In This Section

Menu Blocks,
Version 1.0....73

Project Calc, Version 1.10

Add-In Enhances Lotus 1-2-3's Analytical Power

30 Project Management Functions Keep Reports on Target

By Mike Heck Review Board

Most business professionals currently use project management techniques to closely monitor tasks, people, time, and budgets. Spreadsheets traditionally provide these capabilities.

Managers need to simulate a project's schedule to make informed decisions. For instance, how would overtime costs compare to a late penalty? "What-if" analysis is one of an electronic spreadsheet's greatest strengths.

It seems natural that someone would offer a product like Project Calc, Version 1.10—an add-in that enhances the analytical power of Lotus 1-2-3 (Versions 2 and 2.01) by adding 30 project management functions.

FEATURES:

Many managers do not have time to learn stand-alone project management packages, nor do they always need their expanded capabilities. Project Calc offers numerous project management functions within the familiar, easier-to-learn 1-2-3 environment. A version for Symphony will be introduced this month.

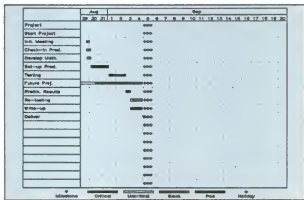
Results generated by Project Calc are placed in a standard 1-2-3 worksheet; they can be combined easily with an overall department budget in another part of the worksheet.

Project Calc attaches to 1-2-3 through Lotus' Add-In Manager, giving you instant access when 1-2-3 is running. It also peacefully coexists with standard RAM-resident programs like Sidekick and Metro.

Project Calc is composed of two modules. One contains the actual project management functions; the other is a menu system that automatically creates formulas using the added computing power. Together the add-ins require 140K, but you can load the functions module alone and create projects manually without the menu module. Each task occupies a row, so maximum project size is just over 2,000 activities (the maximum number of rows available in 1-2-3).

Projects start as a table with task identifier, name, duration, and relationship column headings. Like any 1-2-3 worksheet, project cells contain text, numbers, or formulas.

Resource costs, call assignments, occupy the fifth column. But you can't enter a job classification or a name in this column, so resource leveling (smoothing the schedule to minimize wasted time) is beyond this version of Project Calc.



Project Calc can display Gantt or PERT charts, which can be enhanced with color and printed or plotted using 1-2-3's Printgraph program.

Project Calc requires everyone to work according to one calendar. You control the number of work hours per day and indicate holidays and other time off. Tasks can be scheduled by the hour, day, week, month, quarter, or year.

Although the calendar is limited, scheduling options are complete. Start and finish times, overlaps, and lags between tasks can be specified.

Project Calc's basic input area may seem a bit intimidating at first, since formulas occupy all but the task ID and description columns, but there are several ways to turn this data into useful information.

Graphic options display the schedule as Gantt or PERT charts. These charts are displayed from a menu option and can be enhanced with color and printed or plotted using 1-2-3's Printgraph program.

Unfortunately, on-screen color graphics are not available to highlight the critical path, slack time, and partially completed tasks. As it is, Project Calc's graphics are better than many dedicated project management packages. Shading sets apart task bars on the Gantt chart. Users also control the time scale and can selectively display a range of tasks.

Various tabular reports also help evaluate a project's schedule and financial impact. Early/late start and finish dates, costs, task dependencies, and resources are quickly generated from the menu.

Flexibility is inherent in 1-2-3 and, by default, in Project Calc. All 1-2-3 commands can be used to sort reports, combine and print various tables, compare reports in split windows, and compare display attributes to suit your taste.

But the biggest advantage of using Project Calc is its capability to include results in other models, such as adding individual task costs into a departmental budget.

PERFORMANCE:

Project Calc operates at two levels. Initially you'll appreciate the simple, 1-2-3-style menu interface. Single-key access to all commands is available from one of five main headings: Name, Project, Calendar, Graphs, and Tables. Many users may prefer this approach over learning about the new functions in detail. Experienced 1-2-3 users will soon learn to bypass Project Calc's menu and construct tables using formulas.

You begin a project by checking the work calendar and entering a starting date. You enter a task and determine its duration. Menu assistance then lets you select the duration option.

Each basic command category offers multiple functions with acceptable arguments. For example, three functions let you express duration in terms of total time, work time, or effort. The menu system automatically interprets your response, selects the appropriate function, and enters the formula.

Project Calc imposes few scheduling restrictions. Each task can have one scheduling constraint (start, before, or after), one padding constraint, and one precedence relationship with another task. However, users can build their own formulas. For example, several @Follow functions strung together would designate a task that cannot start until a number of others are finished. (Lotus 1-2-3 places a 254-character limit on the length of a formula.)

Costs are accrued in several ways: at the start of the task, at the end, or even throughout the task or project. Also, Project Calc assigns costs both as a fixed amount or by unit, such as \$25 per man-hour.

Project Calc identifies the critical path on the Gantt chart. One function identifies critical activities on the worksheet, eliminating constant switching to the graphic display.

The project schedule is updated whenever 1-2-3 recalculates the worksheet. You may want to set recalculation to manual since a delay of a few seconds to several minutes occurs whenever a change or new task is recorded, depending on the size of the project. Charts are generated almost instantly, but scrolling is painfully slow. It is possible, however, to go directly to a task or date.

Medical and project management applications simplify data entry by using one or two forms, and they often feature multiple windows to view charts and data together. Project Calc works within the limits of 1-2-3, giving you solid project management capabilities without the frills. We rate performance good.

DOCUMENTATION:

Project Calc's documentation is a model of clear writing and logical organization. The paperback covers installation, using a sample application, menu selections, functions, and error message descriptions. A glossary and index are also included.

The manual's layout incorporates numerous screens for the user's reference and highlights command options in tables. It covers general project management topics and explains tasks in small, precise steps. This helps novices grasp the basics by thumbing through the first half of the book.

Project Calc provides context-sensitive help for each menu item, prompt, or error message. These full-screen descriptions should eliminate most questions on the spot. The help screen also references pages in the manual to look for more information.

This manual lacks a quick-reference card, but it is one of the best we've seen for project management software. We rate it very good.

EASE OF LEARNING:

The installation instructions explain how to copy Project Calc files to your 1-2-3 disk or

subdirectory, modify the 123.Set file to recognize the Add-In Manager, and attach Project Calc. This takes about 10 minutes. Any options previously set with 1-2-3's main install program remain intact.

Even those with minimal project management experience should be able to design a simple project in less than one hour. The way the menu is organized lets you jump easily from one task to the next, enter the required information, and move on to the next activity.

In the few cases where menu prompts don't list available options, on-line help immediately presents valid choices.

Project Calc assumes that its users have a working knowledge of 1-2-3, because they may want to manually set column widths, print ranges, and other characteristics. We rate ease of learning very good.

EASE OF USE:

Project Calc keeps submenus to a minimum so a particular option is never buried deep. Additionally, menus anticipate the likely user response.

For example, after entering a task's duration, you're returned to the main project menu to select the next option, which is what you're most likely to want to do next. On the other hand, if you select Schedule, this command stays active after an entry because you usually need to add additional constraints to the current task. This approach reduces unnecessary keystrokes.

A project is a named range within Lotus 1-2-3. Therefore, you can store several projects within the same work-

sheet. This allows users to combine costs from one project with those of another, and to share scheduling data among projects.

Having access to the actual project functions gives you great flexibility in designing custom project management worksheets.

Experienced users can write macros that quickly build a basic framework for several jobs that are similar in nature; details are then entered manually. Similarly, macros could automatically extract certain information from the schedule and cost tables.

Graphic generation is inconvenient. You have to create a separate .Pic file and process it through the Printgraph program. To save time, Project Calc provides options to customize the charts without requiring users to go into 1-2-3's graph settings. You can specify graph colors, titles, text fonts, and most other settings prior to saving the graphic file.

On the one hand, generating graphics with Project Calc is less convenient than with standalone project management packages, and there are no resource management capabilities in this package. On the other hand, Project Calc uses the familiar 1-2-3 environment and makes it easy to do analysis, incorporate results directly into budget worksheets, and generate reports. We rate Project Calc good in ease of use.

ERROR HANDLING:

Error messages are self-explanatory and lead you to a proper response. For example, if you type in an invalid time code, Project Calc identifies it as an

Alt: (C) [F8] *Task1				
Task1	Duration	Assignment	Next	Previous
Define task range name and description				Quit
A	B	C	D	E
Product	Testing Schedule			
TaskID	Description	Duration	Schedule	Assignments
1	Task1 Project	00:00:15, "HRS"		
2	Task2 Start Project	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
3	Task3 Init. Meeting	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
4	Task4 Check-In Prod.	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
5	Task5 Develop Meth.	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
6	Task6 Set-up Prod.	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
7	Task7 Testing	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
8	Task8 Future Proj.	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
9	Task9 Pre-lim. Results	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
10	Task10 Review	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
11	Task11 Write-up	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"
12	Task12 Deliver	00:00:15, "HRS"	00:00:15, "HRS"	00:00:15, "HRS"

Project Calc applications are essentially Lotus 1-2-3 spreadsheets, and they retain the look and feel of that familiar environment.

unrecognized time unit. The program also spots irregularities between time units used in cost assignment and task duration.

The 1-2-3 edit function can be used to change the current contents of a Project Calc cell. Like any spreadsheet application, new data overwrites old data in each cell you edit. And since each Project Calc application is, in essence, a 1-2-3 spreadsheet, you save your files and protect them from being overwritten in the same manner.

Project Calc identifies scheduling logic errors, but it only provides a very general response. It is up to you to find the relationships that are in error or the data constraint that is out of range. We judge error handling good.

SUPPORT:

Frontline offers telephone technical support at no charge (not toll free) for 90 days. Thereafter, telephone support is available for a fee. A premium phone service for corporate specialists who support end-users is also available.

A 30-day money-back guarantee is included. You receive a full refund if you are not satisfied with Project Calc for any reason. We rate support policies very good.

Our telephone calls were answered promptly and courteously. When our questions couldn't be answered immediately, we received return telephone calls within 15 minutes. In one instance, we uncovered a flaw: When you change the project's start date, the schedule table isn't recalculated properly. The Frontline staff quickly found a way around the problem and indicated that it would be corrected. We rate technical support very good.

VALUE:

Project Calc takes a unique approach to project management, combining the generalized capabilities of 1-2-3 with specific project control functions.

If you've already invested in 1-2-3 and find your projects too unwieldy to manage manually, Project Calc is a good choice. The \$150 investment is a bargain compared to the cost of a dedicated project management package such as Time Line, Superproject, or Microsoft Project.

This is a project manager for those who already use 1-2-3. You wouldn't buy a copy of 1-2-3 and learn it in order to use Project Calc because stand-alone packages offer more advanced and polished features.

You must also consider the type of project reports you require and how that information will be integrated with other data. Project management programs generally offer export capabilities to spreadsheet programs; however, several extra steps are required in order to activate a data export utility. More importantly, export capabilities of stand-alone packages do not provide dynamic data interchange.

Project Calc keeps project reports, budgets, and other custom reports together, eliminating time-consuming steps and keeping all of the information current. This alone is often reason enough for a Lotus 1-2-3 user to consider Project Calc. We rate Project Calc a very good value.

Mike Heck has been managing projects for Infosystems for 10 years.

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INFO WORLD REPORT CARD		
1-2-3 ADD-INS		
PROJECT CALC		
VERSION 1.10		
Criterion	(Weighting)	Score
Performance	(400)	Good
Documentation	(80)	Very Good
Ease of learning	(40)	Very Good
Ease of use	(120)	Good
Error handling	(80)	Good
Support		
Support policies	(40)	Very Good
Technical support	(40)	Very Good
Value	(200)	Very Good
Final score		7.0

PRODUCT SUMMARY

Company: Frontline Systems, Inc., 140 University Ave., Suite 100, Palo Alto, CA 94301; (415) 327-7296.

List Price: \$149.95.

Requires: IBM PC, XT, AT, or PS/2 and compatibles; 512K of RAM (640K recommended).

Pros: Uses familiar Lotus 1-2-3 interface; projects are easy to enter; supports CPM and Precedence relationships; easily integrates project data with standard worksheets.

Cons: No resource leveling; uses 1-2-3 graphics; therefore graphics are slow and must be printed externally.

Summary: A unique approach to project management, Project Calc is worth considering if you use 1-2-3 and don't need the extra functions of stand-alone project management programs.

Menu Blocks

Package Fares Well in Tough Market

By Tom Bigley Review Board

Menu Blocks is Bridgway Publishing Corp.'s entry into the rapidly expanding field of menu software. This is a tough market, with competition ranging from low-cost programs built around DOS batch files to complete — and expensive — packages that include extensive special features. Menu Blocks fares well in this arena, offering smooth performance, some nice extra features, and a reasonable price.

FEATURES:

Menu Blocks is an interesting combination of smooth, intuitive operation for the user and kludginess for the menu creator. The program uses its own path system to find and run programs, relieving any worry about complicated DOS paths.

Menu Blocks' screens are attractive and informative. The program supports all kinds of displays, from composite black and white to VGA, and lets you use Hercules Ramfonts in programs that don't usually support them.

Menu Blocks has a useful screen saver, with a randomly moving message to remind you the system is still running.

The program displays eight menu selections at a time; you can chain up to 99 menus in all.

Menu Blocks includes some unexpected bonus features: a time log feature; a DOS command queue; a DOS manager; and a menu and paths utility. Menu Blocks is also one of the few menu programs we've seen that prompts you for date and time at startup. This feature lets you keep files properly dated or time stamped without adding date and time commands to your autoexec file. These extra features are Menu Blocks' saving graces.

In this review we use the scoring criteria established for our July 18 product comparison on menu makers.

PERFORMANCE:

The top line of Menu Blocks' display shows the date, time, and current directory. The bottom line provides the name of the menu on your screen, available RAM, and information about the logged user and security level. It also displays the status of your Caps Lock and Num Lock keys. The box in the upper left quadrant of the screen is the actual menu; users select the one they want by moving the cursor bar and pressing Enter.

We found the lack of cursor wrap a minor annoyance. And we were surprised by the lack of mouse support. "Point and shoot" programs like this seem particularly suited to a mouse. However, neither is an earth-shaking omission in view of the few selections — eight maximum — on-screen at any time.

The system we used, with

two 30-megabyte hard drives and more than 150 subdirectories, tested the program's capability to find and run programs. Programs loaded quickly from the menu. There is some delay loading programs whose direc-

tories are listed near the end of Menu Blocks' path search table. You can speed things up by designating the directory you want searched first. Unfortunately, this option only lets you designate one search path for an

entire menu, not for individual menu selections. Your other option is to use the Path Manager to move the program's directory listing to the front of the path table. Overall, however, capabilities are very good.

Menu Blocks has one of the best security systems we have found in a menu program. Users are assigned individual passwords and one of three access levels. When users log on the password establishes access lev-

el, determining which utilities they can use, which menus or menu selections they can access, and whether they can exit to DOS. This security method is much more convenient than the more common method of assigning passwords to menus and menu selections. Users only need to remember their own password, and the system manager can change a user's access level, add new users, and delete old ones with a couple of

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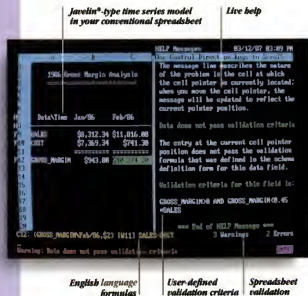
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"Silk's improved graphics, fine use of function keys, interactive help, global search and replace, and easy-to-rearrange worksheet are reason enough to buy... At some point, you have to think about moving onward and upward (from Lotus). Silk gives you reason enough!" — PC MAGAZINE

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Silk is a registered trademark of Daybreak Technologies, Inc. IBM and PC-DOS are registered trademarks of International Business Machines Corporation. Lotus and Lotus 1-2-3 are registered trademarks of Lotus Development Corporation. Microsoft and MS-DOS are registered trademarks of Microsoft Corporation. Javelin is a registered trademark of Javelin Software Company.

keystrokes. When we logged in at Level 0, the lowest of the three, we found it virtually impossible to break out of Menu Blocks itself — short of doing a hardware reset. The DOS window was also unavailable, but we did “sneak out” via Word Perfect’s DOS window. Users with Level 1 access can use all of Menu Blocks’ features except the Security module and Level 2 menu items. Level 2, the Security Officer’s level, provides access to everything.

Menu Blocks does not include a file encryption feature, thus weakening its security. It allows you to use a boot disk to access the files and data. But overall, Menu Blocks’ security system is on a par with systems found on networks and mini/mainframe systems. Security is excellent.

The program is generous with extra features. Menu Blocks’ Time Log provides a good record of user activity on the system. It records the user ID, the start time and duration of each activity, which menu and menu options were accessed, and which programs were run.

We really liked Menu Blocks’ DOS Command Queue. It’s available at the touch of a function key (for Security Level 1 and 2 users), and remembers the last 14 DOS commands you used — including those from previous sessions. When you exit, Menu Blocks saves the current DOS queue and then reloads it the next time you load the program.

The DOS Manager is actually a normal Menu Blocks menu pre-configured with 21 DOS commands. (It can be edited like any other Menu Blocks menu.) It is a DOS help menu that enters the first part of your selected DOS

command on the command line and displays a help screen showing the various options and proper syntax.

A menus and paths utility lets you directly manipulate Menu Blocks’ path search table as well as make changes to the hard disk. You can move frequently accessed subdirectories to the front of the path search table, remove unnecessary subdirectories from the search table completely, and add new ones.

Menu Blocks has an option that lets you enter a program by selecting either its data file or the program’s name. To do this, call the data file and link it to a program name. Once the association is created, a program can be called up by selecting one of its data files.

We rate Menu Blocks very good for extra features.

DOCUMENTATION:

Bridgeway did a nice job with Menu Blocks’ manual. The 150-page training and reference guide includes illustrations on nearly every other page and a complete table of contents and index. The manual has a few omissions and incomplete instructions, but we were generally impressed.

A quick-reference card and overview card supplement the manual.

Menu Blocks’ context-sensitive help screens — not to be confused with the custom help screens for menu selections — are extensive and available nearly any time a Menu Blocks screen is displayed. However, they were only moderately helpful, and most of our questions were answered by going to the manual.

The above-average job earns documentation a score of good.

EASE OF LEARNING:

It shouldn’t take long to be up and running with this program. Setup is quick and easy. It takes only a few decisions about which drive you want to install Menu Blocks on, what kind of display adapter you have, and whether you want to run the time log automatically. Menu Blocks does the rest, creating its own subdirectory, transferring files, and building its configuration files.

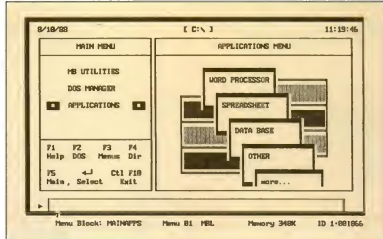
Following installation instructions, the manual provides a few pages briefly describing what you’re seeing on screen, then dives into the three-lesson tutorial. The tutorial is well-designed and takes you through all the steps to set up your system. It shows you how to use Menu Blocks’ DOS tools, build submenus, add programs and DOS commands as menu items, and create customized help screens. Ease of learning is rated good.

EASE OF USE:

Menu users will find Menu Blocks quick and intuitive, and very easy to use. For menu builders, however, Menu Blocks’ mixture of smooth operation and unevenness really shows up.

When you enter Menu Blocks’ menu editor, the utility expects you to enter a menu title on the command line. The prompt for this is virtually unnoticeable, buried in the instructions at the bottom of the help screen. We steamed past this point almost every time we used the utility and ended up ready to edit the current menu rather than creating a new menu. Since every menu is editable in Menu Blocks, we finally thought to edit the editor’s own menu, and moved the prompt to where we wouldn’t miss it.

Once you’ve managed to enter the name of the menu you want to create, Menu Blocks conveniently adds the proper extension and displays a blank menu. Enter the text you want for each menu by typing it in. This is simple and



Menu Blocks' main menu offers access to an extensive set of utilities and a DOS command queue. The screen also shows available RAM and user's security level.

straightforward enough, but if you want the text centered on its line, you'll have to center it manually by inserting spaces at the beginning of the line.

The intelligence continues when you move to the parameters area of the screen, where you define which function each menu selection is to perform. Specify the nature of the selection by highlighting the type field and toggling through the valid choices: DOS command, menu, program, menu field, or assigned.

But when you're ready to enter the name of the program you want this selection to run, Menu Blocks requires you to type in the exact DOS file name and extension. You have to remember whether a program is a .Com or an .Exe file, or Menu Blocks will tell you it can't find the program. If the selection calls another menu, you must remember to type in the proper Menu Blocks extension; the same is true for batch files. This unnecessary extra work is a problem Menu Blocks shares with several other menu makers.

Laying out Menu Blocks' custom help windows is also tedious. In the graphic description area you can use standard ASCII characters to dress up your display. Unfortunately, you'll have to hold down your Alt key and type the decimal code on the keypad to get them on the screen. A help window shows the various characters and their decimal codes, but you can't make selections directly from it. Several key combinations also help you create and edit your screens, but they are not intuitive.

Menu Blocks is as easy for end-users as it should be. For menu creators, Menu Blocks' unique path system eliminates the need for the menu builder to worry about paths and program locations — except for some programs that use overlays. In other respects, however, the menu builder has rough edges. It is possible to create menus with preplanning, however, so ease of use is satisfactory.

ERROR HANDLING:

We had a few error handling problems with Menu Blocks. The first occurred in the tutorial the second time — it had switched from color display to black and white. We found a workaround explained in the manual, but the information was hard to find. The index entry for “loading” sends you to “starting,” but there is no index entry for “starting.”

The second problem occurred when we tried to run Supercalc 4, which was on our D drive. Menu Blocks runs programs from its path table without using the

DOS Chdir command to change directories. As a result, some programs like Supercalc that use overlays can be difficult for Menu Blocks to call up. Not all, however: Autocad uses a lot of overlays and ran without a hitch.

We solved the problem by attaching a batch file to the menu entry to make a DOS change to the Supercalc directory and run the program, then return to the Menu Blocks drive at exit. Technical support provided the same workaround. Nothing in the documentation helped.

With the exception of these two problems, which were solvable, Menu Blocks did very well in error handling tests. We fed the program bad file names, directed it to empty nonexistent disk drives, rebooted (with a reset button) in the midst of various program operations, and tried to access unformatted disks. Menu Blocks rates satisfactory in error handling.

SUPPORT:

Bridgeway offers a 90-day media warranty for Menu Blocks. Technical support (a toll call) is available during normal Pacific time working hours. Menu Blocks comes on a 5 1/4-inch disk. To get a 3 1/2-inch disk, ship the original disk plus \$5 to the vendor. Bridgeway's support policies are satisfactory.

We got through to technical support immediately, although we were referred to a secondary number once. Support staffers were cordial and helpful. One staffer was familiar with the problem we had running Supercalc, having run into it himself with Displaywrite, and was able to create workarounds for other problems. The responsive and knowledgeable staff earns technical support a rating of very good.

VALUE:

Menu Blocks is a natural for offices, schools, and other sites where several people share computers. Its security system is first-rate and easy to manage for both the user and the system manager. The time log utility provides a good usage record that allows managers to keep close track of who is doing what on the system. Users will like the attractive, intuitive menu display. There are a few rough spots — especially for menu creators — and at \$89.95, Menu Blocks costs slightly more than other programs in the same class, but its extra features and performance make it a good value.

Tom Bigley, an experienced microcomputer user, works for a well-known accounting firm.

INFO THE WEEKLY REPORT CARD

MENU MAKER MENU BLOCKS VERSION 1.0		
Criterion	(Weighting)	Score
Performance		
Capabilities	(250)	Very Good
Security	(75)	Excellent
Extra features	(50)	Very Good
Documentation	(75)	Good
Ease of learning	(75)	Good
Ease of use	(200)	Satisfactory
Error handling	(75)	Satisfactory
Support		
Support policies	(50)	Satisfactory
Technical support	(50)	Very Good
Value	(100)	Good
Final score		6.4
Average score this category 6.6		

PRODUCT SUMMARY

Company: Bridgeway Publishing Corp.,
2165 E. Francisco Blvd., Suite A1, San
Rafael, CA 94912; (415) 485-0948.
List Price: \$89.95.

Requires: IBM PC, XT, AT, PS/2 or
compatible; 256K of RAM (512K recommended); PC/MS-DOS 2.1 or later.

Preset Useful system features: time log for
system use tracking; context-sensitive
custom help screens; path manager.

Cons: Menu creator lacks obvious
conveniences; programs with many overlays
may have problems.

Summary: A smooth-running, attractive
menu program whose special features
(first-rate security, detailed use tracking)
balance the inconveniences of its editor.

Hardware Reviews

REVIEWS POLICY

InfoWorld publishes each year in-depth reviews and product comparisons of approximately 1,000 micro-computer products we judge important, interesting, and useful to our readers. To submit a product for review consideration, send product announcements, marketing materials, demos, or ad copy describing the product to Reviews Editor, InfoWorld, 1060 Marsh Road, Suite C-200, Menlo Park, CA 94025. (Send news and new product announcements separately to News Editor.) Please do not send hardware. Unsolicited materials are not returned.

The editorial review board selects products for review for each cycle. If your product is selected, you will be contacted to arrange shipment of the product for review. We request two copies of software; we return hardware, but not software, after review.

Because of the volume of submissions, we regret we are unable to contact vendors regarding products not selected for review.

Applefax, Version 1.1

Modem Brings Fax Capabilities to the Macintosh

The Mac's Graphics-Quality Laser Printers Give Apple the Edge

By Stephen Satchell Director of Hardware Testing

Businesses are using facsimile to replace some of the functions of regular mail, document delivery services, and electronic mail. Using regular telephone lines, fax machines can send documents and drawings from one location to another instantly. An 8½-by-11-inch page can be transmitted in 60 seconds.

Most businesses have a stand-alone machine that incorporates a document scanner, modem, and printer (usually thermal).

Products for sending and receiving fax documents on an IBM PC or compatible system have been available for some time. (See our April 25 product comparison.) These products are best used to transmit word processing files, since this eliminates the need to print the document before sending it.

The Apple Applefax Modem and companion software bring the same capability to the Macintosh. In some respects, the Macintosh is better geared to handling faxes—which are nothing more than document images.

Also, comparatively few IBM PC-compatible systems have graphics-quality laser printers on them; with Macintosh systems they are the rule rather than the exception.

If you want to duplicate what a fax machine does, you will need a Postscript printer that handles full-page graphics and a scanner with software to capture the document.

The scanner alone costs as much as a full-feature fax machine. Also consider that you cannot use your Macintosh for anything else when it is set up to receive a fax document.

FEATURES:

The Applefax consists of the modem (which connects to a Macintosh Plus, Macintosh SE, or Macintosh II), software to control the modem, and a printer driver that enables your applications to create fax files.

The modem is built on the Rockwell chip set. Apple designed a product that looks like a standard AT-command modem. The Applefax is capable of transmitting data as a modem only to another Applefax modem.

On the other hand, as a fax it is designed to work with fax machines that conform to CCITT Group 2 and Group 3 standards. Data is sent and received at 2400, 4800, 7200, and 9600 bits per second.



The Applefax Modem allows Macintosh users to send and receive fax documents at their machines.

The Applefax printing resource provides a printer driver to create fax files you can send. In your application you select the Print command as though you were printing on an ImageWriter or Laserwriter; the resource then builds a fax file. The printing resource can also transmit the newly created fax file to a fax machine or to another Applefax.

The Applefax application provides a complete icon-based fax management package. With the application you manage fax files, address books, and distribution lists.

You receive incoming fax

ability, hardware compatibility, and supplementary features that help speed up your use of the product.

We had no problems with how fast the Applefax sent documents when we transmitted text and graphics from coast-to-coast. We rate speed very good.

We sent a number of images, particularly spreadsheet files, and noticed few glitches in the documents as printed by our fax machine. We rate reliability very good.

The modem plugs into the serial port of your Macintosh, so hardware compatibility is not an

issue. Apple provides a "pass-through" port with the Applefax; it allows you to connect several peripherals to the serial port. We rate hardware compatibility good.

We rate supplementary features satisfactory. The Applefax does direct conversion of word processing files into fax files, and the product is designed to look like a printer to the system. But although the Applefax tries to interface with all Macintosh applications, some don't work properly. For example, the desk accessory Mockwrite 4.3.4 does not work at all.

SETUP:

Setup is easy, provided you purchased everything you need: Apple does not include the one cable you must have to make it work. Otherwise it is just a matter of connecting cables—the icons printed on the modem make this simple—and following the manual's instructions for copying the software into the right folders. Setup on the Applefax is good. The proper cabling and an Install program would have made installation much easier.

Apple insists you use this product with System 6.0. Be warned: some applications do not work properly under 6.0. We successfully used the Applefax with System 4.3 on a Macintosh II and with 4.1 on a Macintosh Plus.

EASE OF USE:

You can take any other Apple Macintosh application out of the box, install it with a minimum of trouble, start it up, and begin to use it without reading the manuals. Unfortunately, the Applefax program is not like that: You have to read the manual to understand how to send a fax document successfully.

You must have the modem connected and powered on before you can do anything with your fax files, whether you need the modem or not. This means you cannot print fax documents on any system, including your own, if the modem breaks. You cannot work around this problem.

Once you've sent your first fax document you should have few problems sending any after that. You can easily send documents from different applications to the same location as a batch. The progress messages are confusing, though. When we

Applefax-equipped Macintosh machines can exchange both fax and non-fax files (acting as a modem).

documents and can print the documents on a Laserwriter. The application keeps track of all unsent fax files and the best time of day to send them.

Applefax-equipped Macintosh machines can exchange both fax and non-fax files (acting as a modem). Furthermore, a remote Macintosh can be used as a store-and-forward fax station ("in care of"), so you can take advantage of location or telephone service differences.

Finally, Apple supplies fonts specifically for the Applefax. These fonts let you send high-quality fax documents.

PERFORMANCE:

Fax performance involves four factors: transmission speed, reli-

ability, hardware compatibility, and supplementary features that help speed up your use of the product.

We rate supplementary features satisfactory. The Applefax does direct conversion of word processing files into fax files, and the product is designed to look like a printer to the system. But although the Applefax tries to interface with all Macintosh applications, some don't work properly. For example, the desk accessory Mockwrite 4.3.4 does not work at all.

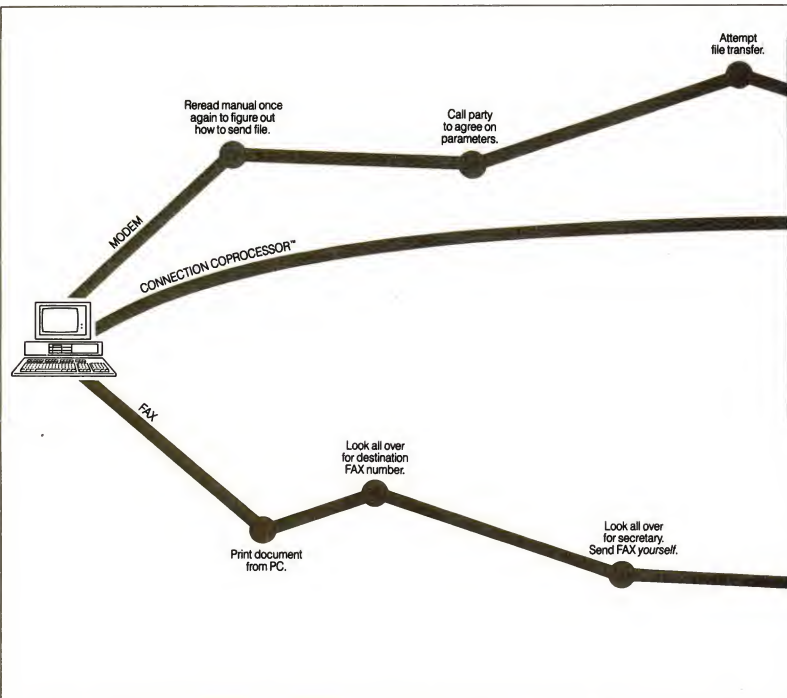
DOCUMENTATION:

InfoWorld believes documentation for hardware products

Also Included
In This Section

Review
Responses 80

Intel announces



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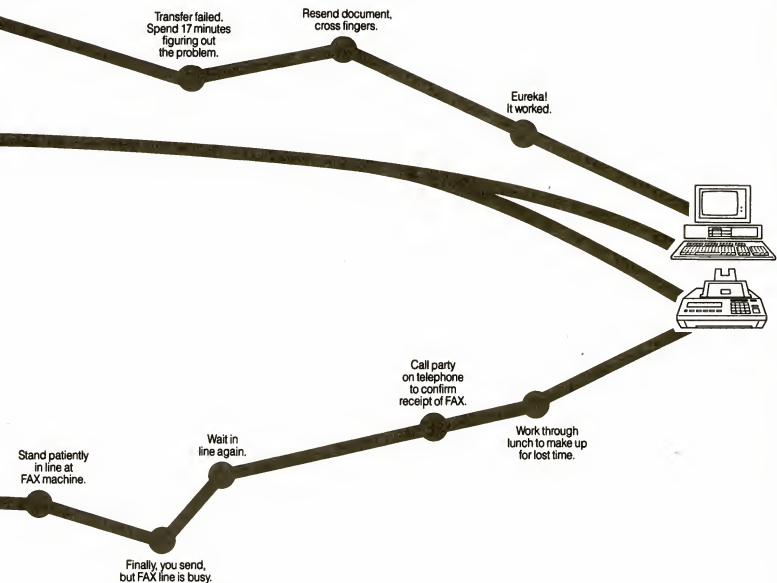
Now your faxes or files can fly cross country. And you can still be zooming around in your flight simulator. Or writing that letter to your biggest account. Or recalculating your spreadsheets for tomorrow's meeting. Without interruption or downtime.

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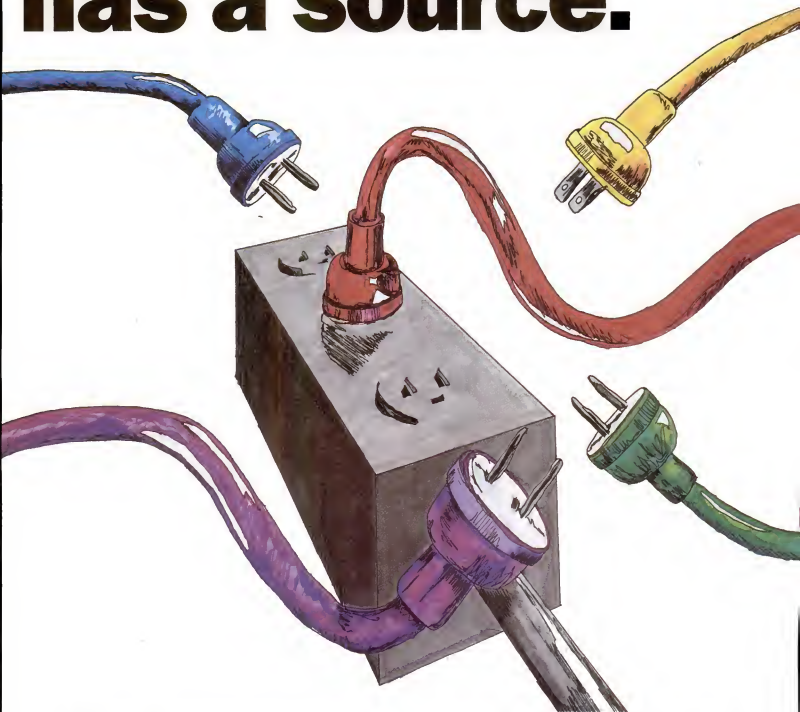
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tested this feature, we sent five one-page files. The program kept telling us it was sending Page 1 but did not identify which document.

Most companies place a cover page on every document sent by fax. This page states the sender's and the recipient's names and telephone fax numbers, and the number of pages being transmitted. Applefax does not generate such a page; we had to use Mac Write to create the cover page.

You can send and receive fax documents only when the Applefax application is running. (Under Multifinder it must be the front document — no background receiving is available.)

Almost all fax machines let you answer the telephone yourself, talk to the calling party, and then start transmitting fax documents by pressing a Start button. There is no such button with the Applefax software; this is a major omission.

We encountered a problem involving configuration: You cannot tell Applefax where to store incoming fax messages. You have to follow the procedure to build a transmission file to the letter. The procedure seems unnecessarily rigid.

Because the package is much harder to use than a fax machine and harder than any other Apple application, we rate ease of use poor.

SERVICEABILITY:

The Macintosh is clean and well-assembled.

Workmanship on Applefax earns a score of excellent.

Support policies are poor. Apple warrants the modem for 90 days instead of one year. We believe some of the extended-care options do not make up for the short warranty period.

Technical support is supplied by the dealer, although Apple publishes a telephone number on the warranty card. This number connects you with a customer relations representative who will answer your questions only after you give your dealer's name. Based on our calls to both Apple and dealers, we rate technical support satisfactory.

VALUE:

Facsimile was designed to instantly send and receive documents. How does the \$699 Applefax do at these jobs?

You must be willing to dedicate a Macintosh with a hard disk if you want it to receive faxes unattended. Otherwise, receiving a fax is a two-step process: A voice call informs you a fax call is coming; you stop what you are doing and activate the Applefax application to receive the documents in a second telephone call. Remember, the first minute is the most expensive part of any telephone call.

Applefax provides a number of very readable fonts that do not require a laser printer. You can scan a signature into a file to sign a letter, but you cannot protect it from being copied and used illegally.

These caveats are not unique to the Applefax, as we discovered in our comparison of fax boards for IBM compatibles (April 25). The integration of most Macintosh applications enhances

the value of this product. The Applefax is a good value.

Stephen Satchell, InfoWorld's director of hardware testing, has 15 years' experience as a systems designer, product programmer, and hardware evaluator.

RELATED REVIEWS

PC FAX BOARDS

Product Comparison: PC Fax Boards.

April 25:
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FX-8M89
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- “Desktop Publishing: Personal Productivity Tools for the 1990s,” keynote speaker, Theodor H. Nelson, Inventor of the concept of Hypertext and designer of Xanadu™
- “Office Publishing: the Future of Work Processing,” keynote speaker, Henry Ancona, Vice President of Business & Office Information Systems, Digital Equipment Corp.
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INFO THE NEWS WEEKLY WORLD

REPORT CARD

FAX BOARDS

APPLEFAX MODEM

VERSION 1.1

Criterion	(Weighting)	Score
Performance		
Transmission speed	(150)	Very Good
Reliability	(100)	Very Good
Hardware compatibility	(150)	Good
Supplementary features	(50)	Satisfactory
Documentation	(75)	Very Good
Setup	(75)	Good
Ease of use	(150)	Poor
Serviceability		
Workmanship	(50)	Excellent
Support policies	(50)	Poor
Technical support	(50)	Satisfactory
Value	(100)	Good
Final score		6.1
Average score this category		6.0

PRODUCT SUMMARY

Company: Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010.

List Price: \$699.

Requires: Macintosh SE, Plus or II; System 6.0.

Pros: Converts word processing files into fax files; complete icon-based fax management package; fonts produce high-quality documents.

Cons: No background mode, so requires dedicated operation in fax mode; fax files cannot be accessed if modem breaks; requires two phone calls to receive fax.

Summary: A capable fax/modem system for the Macintosh.

Review Responses

MAC EXCEL'S MEMORY

Your review of Microsoft Excel ("Evolutionary Mac Spreadsheet Maintains Market Supremacy," August 15) states: "Excel is a RAM-based application, and it will not use virtual disk memory. Its memory use can be controlled under Multifinder using the Get Info command from the Finder, letting you create Excel 1.5 worksheets that take up most of the available RAM (8 megabytes or more on Mac II)." This is incorrect. Excel 1.5 is incapable of creating spreadsheets that access more than approximately 1 megabyte of memory. This is a design flaw in the p-code system used to generate the application and in its memory addressing scheme. The program and all memory-resident spreadsheets can occupy no more than 1.4 megabytes.

Excel 1.06 and lower versions also had trouble, depending on where Multifinder placed the spreadsheet. The Mac's memory map. Excel 2.0 will reportedly abolish the 1.4 megabyte limit.

Linda Custer
Berkeley, CA

I am puzzled by your recent review of Microsoft Excel for the Macintosh. Having read in several publications that Excel 1.5, like its predecessors, could only utilize 1 megabyte of memory, I was surprised by the report that you could allocate up to 8 megabytes under Multifinder. First, I tried it on my 2-meg Mac Plus with a 1,600K "largest unused block" of memory. If I allocated more than 899 megabytes to Excel (using the Finder's Get Info command), the program failed to load and run properly, instead returning me to the Finder. On my 5-meg Mac II, with a 3,533K "largest unused block" of memory, the program stopped loading when I got the memory allocation up to 1,000K.

Did you review the same Excel, Version 1.5 that Microsoft shipped to us? David Lerner
Current Designs Corp.
New York

Our statement about using 8 megabytes under Multifinder with Excel 1.5 is incorrect. We confused Excel 1.5 with an early beta of Excel 2.0, which changes the way memory is mapped to the application heap, breaking the 1.4MB barrier. We didn't catch the error until after it went to press. The actual logical limit of memory for Excel 1.5 is 1.4 megabytes; however, only about 1 megabyte can be used effectively before you start getting unpredictable interactions (especially with System 6.0, Finder 6.1, and Multifinder 6.0).

With the old System 4.2 and Finder 6.0, when we set the memory size to greater than 1,100K, Excel 1.5 failed to load, with a fragmented memory error message. With Multifinder 6.0 and the newer System 6.0 and Finder 6.1, however, we did not get the load failure described above. Instead, Excel 1.5 loaded, and the Get Info window showed it as using the amount we had requested, i.e., an 8-megabyte color Mac II. However, the Get Info window is notoriously inaccurate under Multifinder 6.0 when displaying how much memory is really being used by an application, and a closer examination revealed the program was really only loading with the original application memory size, not with the amount we had requested.

Our apologies for the confusion and

misinformation.

—Editors

ADVANCED REV FANS

Having seen the dismal score accorded to Advanced Revelation (AR) in your relational database product comparison (July 4), I feel the product needs some defending.

In review case, the low score masks some very favorable comments in the review text (not to mention the Executive Summary), as well as the experience of tens of thousands of users and developers that Advanced Revelation is an outstanding piece of software. Aspects mentioned or briefly mentioned in the review were its variable-length fields, multiple values-per-field capability, flexible "foreign" file interface capability, outstanding context-sensitive help system, and its multitude of data validation and formatting options.

Access to telephone technical support is definitely dismal right now, but I feel that is due to the increasing number of new users. You didn't mention tech support through the Revelation BBS available to registered users, which should have pulled up the support score.

I constantly emphasize to our clients that using a number of numbers to measure a complex software package is simply not valid. Testing, but invalid.

I should say that while I do have a vested interest in Revelation (as a developer and the author of the Revelation Expert column in *Data Based Advisor*), I don't sell it and have no ties to Revelation Technologies.

John Gunther
Principal,
Bucks & Bytes
Rosendale, NY

I am the president of the Manhattan Revelation Users Group, an unpaid position with no connection to Revelation Technologies, and an independent consultant who frequently programs in Revelation and Advanced Revelation. I therefore read your review of Advanced Revelation in your latest relational database product comparison (July 4) with a great deal of interest.

While I found the review to be generally accurate, it didn't mention many of AR's most powerful and uncommon features, including some crucial in my initial decision to begin working in Revelation. Chief among these were variable-length and multivalued fields, both of which go a long way in allowing a developer to accommodate the real world inhabited by users.

Also unmentioned were AR's full variety of screen hooks (the screen painter explicitly allows for pop-ups or user-defined functions and routines before, during, or after any window, prompt, or field); network-locking options (applicable to single records instead of whole files); indexes (relational, B-tree, cross-reference, or user-defined, such as Soundex); macro, script and keyboard definition facilities, and file operations. (AR's modified field structure and user-adaptable base filing system allow experienced programmers to handle all file access for users from encryption to seamless integration of AR with other applications.)

Also absent was any comment (save for the bare rating) on the richness, adaptability, or ease of use of R/Basic (Revelation's programming language).

Many attributes singled out for favorable mention with respect to Clarion are also present in AR, including pop-up tables of possible values and specification of uppercase only, or justification during screen creation. In AR, as in Clarion, "there is almost no limit to the amount of customization possible in creating data entry screens." Not only can AR data files include arrays and group fields, but all AR records are arrays, and variable length arrays at that.

Given the investment in time and money any developer must make in choosing a work environment/language, your oversight in describing AR's capabilities may shortchange some readers when they choose their next database. Once you take the time to learn it, AR has the "programming flexibility" and "cosmetic pizzazz" to match its "pure database muscle."

Daouglas E. Forrest
New York

NEC, BETTER THAN THAT

As much as I enjoyed your recent product comparison of ATs (July 25), I was somewhat shocked to read of your low opinion of the NEC Powermate 1. This model, in my experience, is one of the best AT compatibles on the market. Far from having poor workmanship, it has a clean design and takes a backseat to none when it comes to reliability. If every manufacturer took the care NEC does to ensure product performance and customer satisfaction, the job of computer retailers would be much simpler.

My customers are a lot more interested in product reliability than they are in processing speed. And when they want speed, I introduce them to the 12-MHz zero-wait-state Powermate 1 that you folks should have evaluated. If you had, NEC would have been near the top of your charts instead of the bottom. I think you gave me bad advice to your readers in the case of the Powermate 1.

John McPhail
Power Computers
Burlington, MA

NEC says they inadvertently sent us a demonstration unit rather than a shipping unit, which accounts for the poor workmanship we observed. We would have evaluated the 12-MHz unit had it been shipping in time; we plan to review it when it becomes available to us.

—Editors

FOXBASE KUDOS

Thank you for an excellent review of Foxbase+/Mac ("Not Just Port, Speedy Foxbase Offers Genuine Mac Interface," July 18). A very gratifying feature to be rated the top Database-compatible relational database manager on both the PC and the Macintosh.

Several improvements are planned for the next release of Foxbase+/Mac. Version 1.0, due out in September, will have the forms generator you so highly recommended; it will be provided free to all registered users of Version 1.00.

Please note that the portion of your review regarding error handling was not quite accurate. Foxbase+/Mac does write updates to disk automatically. In fact, the buffer is flushed when a Read command is executed, upon entry to the interactive mode, and when changing records in Browse.

We adopted this buffer-flushing strategy after discovering very early in our beta testing cycle that leaving data in the buffers until the user Quit or executed the Flush command was inappropriate, espe-

cially on the Macintosh under Multifinder. We found that under Multifinder, users could be running other, unrelated applications whose bugs would crash Foxbase+/Mac, resulting in data loss. To prevent such crashes, we implemented the strategy mentioned above.

Richard E. Ney
Director of Marketing
Perryburg, OH

DATABASE WISH LIST

Your recent product comparisons on relational databases (April 18 and July 4) have been both interesting and informative. Testing with 100,000 records is especially appreciated because so many reviews seem to have been conducted with the vendor-supplied demo databases of 20 or so records.

Some of the differences you uncovered are amazing. For example: How can Foxbase Plus complete an import in 16 minutes while other products take over eight hours? Do you review test results with vendors before you publish them?

I have experimented with numerous packages without finding the ideal one, but I have come up with a wish list for the perfect product. It should consist of a resident database engine running in as little memory as possible since the 640K that DOS provides seems to get smaller daily. Files would be defined through an active data dictionary interface and would include numeric, date, money, logical, character, variable-character, and numeric fields. Native and money formats would handle international conventions without any programming change. Default column headings, not just the variable name, would be included in the data dictionary, and all data types would have a picture capability.

There would be a screen formats designer/painter and a non-procedural data entry and retrieval system. A capable report writer would be included. End-users and occasional programmers would also be able to use these features. There would be a procedural 4GL that would also be able to access the screen forms, and the screen forms would be able to call 4GL routines. The 4GL would be able to call routines written in a 3GL to access foreign databases, whether on the LAN or on a mainframe. A 3GL would be able to access the data through the resident database engine with heavy computation and speed are necessary.

Of course, everything would work at blinding speed and would fit easily into 640K, even with memory-resident programs present. If the product runs on IBM mainframes under MVS and VM, that would be a wonderful bonus.

If only XDB, Progress, Clarion, and Foxbase could all be combined into one.

Sam Lennan
Pasadena, CA

Some of the products import slowly because, unlike Foxbase, Base, or DBXL, they update their indexes record by record as they import. Some can turn off automatic indexing updating in order to speed things up for large-scale imports.

We talked to the vendors about their results, many claim slow sort speeds or undetected access times are not a problem because their users don't perform these functions often.

—Editors

InfoWorld welcomes comments about its reviews. Letters are subject to editing for space and clarity. Please address correspondence to The Reviews Editor, InfoWorld, 1050 Main Road, Suite C-200, Menlo Park, CA 94025.



On the Horizon

By William F. Zachmann

Upcoming Announcement of IBM's Model 35 Is a Step in the Wrong Direction

The numerous reports of an upcoming announcement of a new Intel 286-based PS/2 Model 35 from IBM with ISA (industry-standard architecture) AT-style expansion slots have at least provided a break in the summer doldrums. So has IBM's extraordinary campaign to persuade members of the press that such a machine would not constitute any retreat from IBM's proprietary Micro Channel Architecture (MCA).

It has always been IBM's firm policy not to comment on unannounced products. Nevertheless, IBM's James Monahan quite obviously spent a lot of time talking to the press on the topic of the new system. *InfoWorld*, *Computerworld*, and *PC Week* all carried front-page stories in their August 22 issues quoting him.

Mr. Monahan, identified in all three stories as an "IBM spokesman" rather than by job title, certainly was doing his damndest to convince the major trade weeklies that a 286-based PS/2 with ISA slots was really one small step ahead for the PS/2 rather than a return to the AT. That means, plain and simple, that somebody at IBM was getting real worried the Model 35 would be interpreted as a retreat from the Micro Channel Architecture.

Mr. Monahan didn't just happen to be chatting with reporters from all three major weeklies around the same time. Somebody at IBM obviously decided

and is hedging its bets by introducing an AT-bus system. IBM would not introduce a 286 with AT slots at this point if it wasn't worried about lukewarm acceptance for the MCA!

The problem for Big Blue, of course, is that by demonstrating its own lack of confidence in the MCA, IBM will only encourage the growing majority of users who already realize that the MCA brings them little but higher prices and fewer choices.

The motivation for such a product is

obviously to try to regain some of the sales that were lost to compatible vendors as a result of IBM's strategic error in killing off the AT after the PS/2 was introduced, despite continued user demand. IBM obviously wasn't interested in providing what its customers wanted and lost sales as a result.

Backpedaling by IBM at this point, however, will only make matters worse. The Byzantine complexity introduced into the PS/2 line by the Model 50 Z and Model 70, with their bizarre overlaps

with the older models, will get even worse. The Micro Channel Architecture strategy, already in trouble, will be in even bigger trouble.

Given all that, don't be too surprised if the recently much discussed Model 35 is given a quiet, private burial without ever seeing the light of day. The world needs another 10-MHz 286 from IBM like a fish needs a bicycle. And IBM certainly does not need to make a public retreat from the Micro Channel Architecture—unless IBM plans to run back all the way.

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IBM worried it would be perceived as retreating from the MCA.

that it was extremely important to get IBM's version of things across fast in an effort to convince users that, contrary to what nearly everyone else was saying, an AT bus in a 286 was consistent with IBM's PS/2 plans and strategy.

Poor Mr. Monahan! About all he could come up with was simply to tell everyone that a PS/2 with an AT bus wasn't really a reintroduction of the AT because it has 3½-inch disks and better graphics built in. Oh, and he reminded everyone that IBM said at consultants' and press briefings last February that a low-end 286 system was in the works.

Having been at one of the briefings where IBM Entry Systems Division president Bill Lowe dropped those hints, I am sure that there was no suggestion that this would be an AT-bus machine. On the contrary, the big emphasis was on the Micro Channel Architecture, its supposed virtues, and its eventual expansion across the entire PS/2 line.

IBM has good reason to fear that users will take the introduction of a 286-based PS/2 as an indication that IBM is worried about lukewarm acceptance for the MCA

William F. Zachmann is vice president of corporate research for International Data Corp., a market research firm owned by the same parent company as *InfoWorld*. The views expressed are his own.

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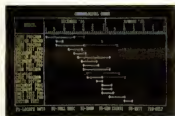


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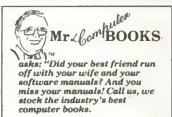
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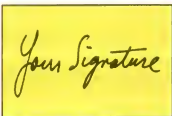
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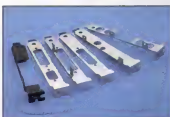
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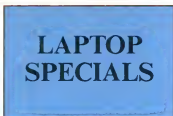
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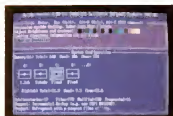
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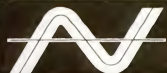
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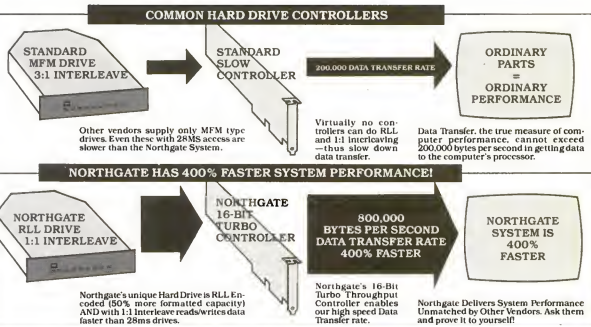
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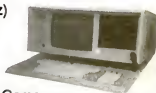
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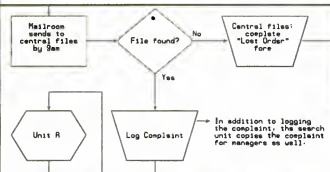
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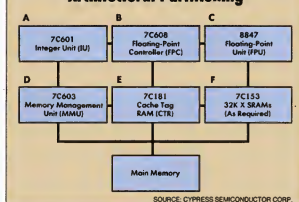
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Cypress 7C600 Program
Architectural Partitioning

SOURCE: CYPRESS SEMICONDUCTOR CORP.

TI and Cypress' cross-licensing agreement gives Cypress the FPU, while TI will get the IU, FPC, MMU, CTR, and SRAMs.

RISC

Continued From Page 1

said Ross. "The next phase is to integrate further."

"The interesting thing about SPARC is that it's sort of a semipublic domain [device]," said Ross, who predicted SPARC will be an attractive architecture because a number of suppliers will be competing to do a better job.

"The goal is to get the processor and support chips into the 50-MHz area as soon as possible," Ross said. He expects progress toward that goal to be relatively smooth.

"There are lots of methods that are all part of integrating forward to that eventuality of a system on a chip," said Brian Halla, vice president of LSI Logic Inc.'s newly formed microprocessor products group. Halla said he joined LSI Logic

because the company was positioned to realize the dream of a system on a chip. That chip will include "basically everything but DRAM," said Halla.

"The stars are lining up, the possibility of Evermann having 20 MIPS on a desk is not a future anymore, it's here today," Halla said, indicating LSI Logic's introduction last week of new RISC architecture chip sets based on the SPARC and MIPS architectures.

"That brings up another possibility: If you can put 20 MIPS on a desktop and run a DOS emulator, and have just some of that MIPS, you can have full-speed DOS running on a standard platform," Halla said. "It begs the question of what's going to happen to the PC industry as we know it today. And RISC is just at the beginning of the learning curve in terms of performance capability."

—Tom Moran

IBM

Continued From Page 1

The IBM RPG II Applications Platform is built around a software package, called Baby 36, designed by California Software Products Inc. It will allow users of PS/2 Models 50, 60, 70, and 80 computers, as well as other systems that will run OS/2, to run applications written in the RPG II programming language.

Over 4,000 application programs that were written in RPG II will now be available under OS/2, sources said.

With the addition of IBM's Multipoint card for the MCA, the platform will also support up to eight 3151-compatible computer terminals. A source close to the company who has used the multiuser implementation said the performance on a Model 70 or 80 was "tremendous."

The original Model 30 came in two configurations: a two-floppy system that retailed for \$1,695 and a 20-megabyte ver-

sion that retailed for \$2,295.

Both new machines are competitively priced, sources said, with the low-end machine retailing for under \$2,000. Assuming the standard corporate volume discount price of 35 percent, this means PC managers can acquire the low-end machine for approximately \$1,300.

"These are going to sell like hotcakes," said one source briefed by IBM. Another called them "clone-killers."

Currently, the street prices of 286 machines range from \$1,900 to \$2,600, according to JoAnn Stahel, vice president of Storebrand Inc., in Dallas.

"Presently, IBM doesn't have a 286 offering in that price range," Stahel said, adding that the new machines would be competitive for that class.

Sources briefed on the machine say it is intended as a low-end single-user workstation for users and applications not requiring a lot of expandability or power. The machine — particularly the floppy drive version — will be especially suitable as a node on a network, sources said.

SPARC

Continued From Page 1

SPARC community, TI will receive the masks for the Cypress version of the SPARC chip, and Cypress will receive the masks for TI's new floating-point unit, the TMS 8847, as well as the masks to a future version, the TMS 8848. TI will implement the Cypress chips using its new 0.8-micron EPIC-11B bi-CMOS process and use the resulting chips in a new series of workstations. The EPIC-11B process is the same one TI is using to implement its 16-megabit DRAM chip, according to TI executive vice president William Weber.

The Cypress 7C600 SPARC processor family currently runs at 33 MHz and generates about 20 MIPS of processing power, Rodgers said. "We are just around the corner from having these chips run at 40 to 50 MHz," he said.

Cypress and TI confirmed that the circuits will be both electrically and plug compatible.

The cross-licensing agreement covers the Cypress

CY7C601 integer processor, the 7C603 Memory Management Unit/Cache Controller, the 7C153 Cache RAM, and the 7C181 Cache Tag chips, all of which will be produced by TI under the five-year agreement. Cypress will have the rights to second-source the next-generation SPARC processor currently being developed by TI and Sun.

The Cypress version of the SPARC architecture differs from its Fujitsu counterpart in more than its packaging, clock rate, and MIPS rating. It can also handle the atomic load-and-store instructions and test-and-set instructions that are crucial to the creation of multiprocessor architectures, according to Dane Elliott, manager of applications at Cypress.

The Cypress SPARC chip and TI 8847 floating-point unit are linked in a design by using a gate array created by LSI Logic. At last week's announcement, Weber said a new floating-point unit, the TMS 8848, would be designed to connect on-board so only two chips would be required. "After that, we'll work on integrating the FPU and the SPARC chip, but that won't happen for a long time," he said. He estimated the TMS

8848 chip would be available in the second half of 1989.

Matsumita's endorsement came in the form of an announcement by Solbourne Computer Inc. of Longmont, Colorado, in which Matsumita is a majority owner.

Solbourne said it has licensed SPARC from Sun and is designing a 64-bit chip based upon the SPARC architecture.

The design integrates a floating-point processor, a memory management unit, and cache memory, along with the SPARC CPU on a single chip, according to the company. It will require ultra-large-scale integration (ULSI) chip design and manufacturing assistance, which will be provided by Matsumita.

"We chose SPARC after carefully evaluating the alternatives," said Douglas MacGregor, Solbourne's president.

The company plans to produce an initial SPARC workstation based upon the Fujitsu SPARC chip in early 1989, according to a spokeswoman, Mary Coleman. No exact time frame has been established for a workstation based upon the 64-bit chip, except that work on it will be "in the 1989 time frame," she said.

HP

Continued From Page 1

trays can hold 200 sheets, giving the printer a total of 400 sheets on-board. There is a feed guide for manual paper insertion.

Switches on the control panel allow the user to set up either landscape or portrait format printing, allowing for binding on either the long or short edge of the paper. This avoids the neces-

sity of having to buy special fonts for landscape printing.

Another optional mechanism, which plugs into a paper bin, will allow up to 50 envelopes to be printed directly.

The standard configuration of the Laserjet IID contains 14 internal fonts plus an S2 cartridge that holds 10 more fonts. More fonts can be added, either with additional cartridges or by downloading from a floppy.

The basic engine driving the Laserjet IID is an 8-side-per-

minute Canon LBP-8RX, which was introduced in Europe last year but has yet to appear in the United States.

The base configuration of the printer can print up to half a page of 300-by-300-dpi graphics. Full-page graphics can be obtained by adding 1-megabyte, 2-megabyte, or 4-megabyte optional memory boards.

HP has already announced producing the Laserjet 500, its previous duplex laser printer, according to sources.

Borland Reorganizes to Reduce
Costs, Project Professionalism

By Rachel Parker

SCOTT'S VALLEY, CA — The once-flamboyant Borland International last week announced a companywide reorganization designed to bring costs down while emphasizing a more professional image.

In the reorganization, Borland combined technical support and product services in the sales organization, established a stronger focus on the productivity packages and new Professional Turbo languages, and laid off 13 percent of its staff — about 90 jobs. The affected jobs were primarily in support and administration where the reorganization resulted in duplicated efforts. Research and development and management ranks were not affected.

"Borland has been restructured so it can better compete in battles engaged in now with Lotus and Ashton-Tate," said

Philippe Kahn, the company's CEO. "The plan is to be more profitable and to have the right structure to compete in the marketplace."

As part of the restructuring, Borland has recruited two new managers: Stephen Kahn, formerly of Lotus, will be vice president of marketing, and Stephen Green will become director of business development.

While cutting costs, the marketing reorganization was also undertaken to project a more professional image, Kahn said. "I used to run a gimmicky marketing organization. Now it is time to run efficiently, professionally."

For the last fiscal year, Borland's sales neared \$82 million, but it spent nearly \$80 million. The reorganization should save the company \$500,000 to \$1 million per month, it said.



Big Blue to Abandon MCA? No Way!

I awoke to the sound of chewing. "So what's the news, Bob?" asked Pammy, my next-door neighbor, sitting on the edge on my bed, a 20-year-old vision in black leather, metal studs, and spiky hair. Pammy was eating a bowl of cornflakes.

"It's Thursday, right, and you gotta write your column, so what's the news?" A drip of milk clung to the corner of her mouth.

Pammy's just the kind of girl who figures out where you hide the spare key, then enters your house early in the morning to eat cornflakes on the edge of the bed. Don't we all have friends like

that?

"Get out of here, Pammy!" I yelled, instantly awake and painfully aware of what I was—or wasn't—wearing.

"I'll wait for you downstairs," said Pammy, ignoring my embarrassment.

"Then you can take me out for another breakfast."

FEELIN' KINDA LOWE. "So what's the latest in the soap opera—you know, IBM," Pammy asked half an hour later while plowing through a stack of waffles.

Rumors are flying about a life-and-death struggle going on over the Micro Channel, of all things. Supposedly, Bill

Lowe, who defends his decision to change the industry-standard bus, is on the losing side and will be put out to pasture very soon (old IBM execs never die, you know, they just get promoted), followed by a general shift back to the old AT bus. Personally, I think this is nonsense. Lowe will go, sure, but IBM's not about to dump the MCA.

DUELING DWARFS. "You know what IBM needs?" Pammy asked, chewing with her mouth open. "Blake Carrington—you know, from *Dynasty*? He'd do a better job than these hotdogs, and he'd dress better too."

Here's a *Dynasty* script for you: IBM has told its dealers that it won't be introducing new laptops on September 13, as expected earlier, but Compag doesn't believe IBM and is still planning its own laptop intro for October 17.

But if IBM doesn't introduce its laptops, look for Compag to push its announcement back even further. Compag, unwilling to be upstaged by IBM, will change price, specifications, anything at the last minute in order to come out on top, and that requires waiting for Big Blue...

WHAT'S SMALLER THAN A DWARF? "I'd like to have a computer," Pammy mused, "but it would have to be small enough to carry on my scooter so easy to use, and maybe I could just talk to it, you know, because I don't really like to type."

I don't know about the talking part, but from what I hear, Chips & Technologies will intro at the end of September a chip set for making "Ultralights," a new class of hand-held DOS-compatible teeny-tinys. NEC will announce an ultralight laptop in October, which may or may not use the C&T chip set. The little hummer from NEC supposedly uses a 286, has a full-page display, and weighs in somewhere between 2 and 4 pounds. Expected to cost about \$2,500. That could be as much as \$1,250 per pound.

SOFT IS NOT HER STYLE. Given her penchant for black leather and metal studs, I shouldn't be surprised that Pammy has a definite preference for hardware. She seemed uninterested in the two upcoming versions of Microsoft Word for the PC. Version one, coming sometime before Comdex, is character-based. Version two, coming in the first quarter of '89, might be graphically based, but I promised my source that I wouldn't say.

Also on the way from Redmond is Quick Basic 4.5, which went into beta test last week, with a new editor and a Hyperlink help system.

Finally, Symantec denies it, but I hear that Tops might be buying Inbox, the Mac and PC E-Mail package. Anything to keep Microsoft from owning yet another market, I say.

"I'm bored, Bob. Let's go," Pammy said, rising from the table.

WORK IN THE APPLE. Walking out of the restaurant, we passed a guy wearing blue jeans and a cotton sweater. "Mistress Pammy!" he cried in surprise, dropping to his knees.

"You worm!" Pammy yelled at the man kneeling on the sidewalk before us. "How dare you talk to me in public! Tell my friend Bob an Apple secret or suffer the consequences!"

"Apple has several Mac configurations in the works, including one with a 386 chip on the board—in addition to a 68020," the man said, his voice quivering. "They're trying to qualify for some enormous government bid requiring not just a DOS coprocessing card. Also in the works is an MS-DOS command line interpreter. Now, may I please suffer the consequences, Mistress Pammy?"

"No!" shouted Pammy, walking away. "Don't tell anyone you saw this, Bob," she said when we got into the car. "It's only a job, you know."

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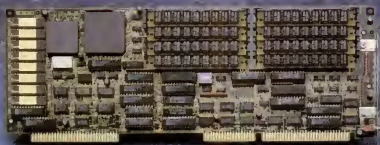


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